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Traffic Safety  
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# Field Test of a Motorcycle Safety Education Course for Novice Riders

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16. Abstract The purpose of this study was to subject the Motorcycle Safety Foundation's Motorcycle Rider Course (MRC) to a large-scale field test designed to evaluate the following aspects of the course: (1) Instructional Effectiveness, (2) User Acceptance, and (3) Administrative Feasibility. Results of the field test evaluations indicated that:  <ul style="list-style-type: none"> <li>. Course graduates acquired the basic skills and knowledge required for street riding</li> <li>. The MRC is administratively feasible in terms of its schedule, costs and demands placed upon instructors, students and facilities.</li> <li>. Students and instructors found the course to be a valuable and enjoyable experience</li> <li>. School administrators and parents approve of the course and would like to see it continued in their school system.</li> </ul> Findings regarding a number of other rider education research issues are also reported.					
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## METRIC CONVERSION FACTORS

### Approximate Conversions to Metric Measures

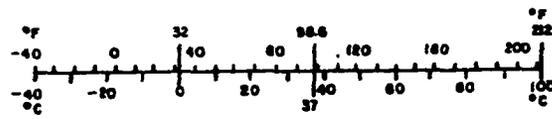
Symbol	When You Know	Multiply by	To Find	Symbol
<b>LENGTH</b>				
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
<b>AREA</b>				
in <sup>2</sup>	square inches	6.5	square centimeters	cm <sup>2</sup>
ft <sup>2</sup>	square feet	0.09	square meters	m <sup>2</sup>
yd <sup>2</sup>	square yards	0.8	square meters	m <sup>2</sup>
mi <sup>2</sup>	square miles	2.6	square kilometers	km <sup>2</sup>
	acres	0.4	hectares	ha
<b>MASS (weight)</b>				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
<b>VOLUME</b>				
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft <sup>3</sup>	cubic feet	0.03	cubic meters	m <sup>3</sup>
yd <sup>3</sup>	cubic yards	0.76	cubic meters	m <sup>3</sup>
<b>TEMPERATURE (exact)</b>				
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

\* 1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price \$2.25, SD Catalog No. C13.10-286.



### Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
<b>LENGTH</b>				
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
<b>AREA</b>				
cm <sup>2</sup>	square centimeters	0.16	square inches	in <sup>2</sup>
m <sup>2</sup>	square meters	1.2	square yards	yd <sup>2</sup>
km <sup>2</sup>	square kilometers	0.4	square miles	mi <sup>2</sup>
ha	hectares (10,000 m <sup>2</sup> )	2.5	acres	
<b>MASS (weight)</b>				
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
<b>VOLUME</b>				
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m <sup>3</sup>	cubic meters	36	cubic feet	ft <sup>3</sup>
m <sup>3</sup>	cubic meters	1.3	cubic yards	yd <sup>3</sup>
<b>TEMPERATURE (exact)</b>				
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



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## SECTION 1

### EXECUTIVE SUMMARY

#### PROJECT OVERVIEW

The purpose of this study was to subject the Motorcycle Safety Foundation's (MSF's) Motorcycle Rider Course (MRC) to a large-scale field test designed to evaluate the following aspects of the course:

1. Instructional Effectiveness.
2. User Acceptance.
3. Administrative Feasibility.

Course/curriculum revisions designed to address problems revealed by these evaluations were to be developed, and a plan for assessing the MRC as part of a National Highway Traffic Safety Administration (NHTSA) demonstration project was to be specified.

As work on the project proceeded, additional research needs surfaced. These included:

- Evaluation of the need for actual on-street training.
- Development of procedures by which students with some riding experience could be "pre-tested" prior to course assignment.
- Development of a shorter version of the course (12 hours) for students who demonstrate acceptable pre-course skills.
- Assessment of the effect of charging a course fee.
- Determination of the extent to which newly-licensed riders would voluntarily take the MRC.
- Conduct of a Licensure Study to determine if offering the MRC to high-school students increased their rate of motorcycle licensure vis-a-vis students for whom the MRC was not available.
- Evaluation of a survey of MRC graduates to determine their motorcycling exposure and the transportation mobility benefits of motorcycle riding.

Assessment procedures and instruments tailored to the evaluation components of the project were selected from existing sources, or developed as required. These included knowledge tests, on-cycle performance measures, attitude/opinion questionnaires, and tests of street-riding skills.

From September 1977 through October 1979, fifty class sections of the MRC were conducted through the Jefferson County Public School System, located near Denver, Colorado. Over 600 students, ranging in age from 16 to 72, were enrolled in the course. Throughout conduct of the course, students, parents, instructors, and school administrators were participants in a variety of evaluation activities.

The Licensure and Exposure/Transportation Mobility studies were conducted during the Spring and Summer of 1981.

### RESULTS/CONCLUSIONS

Conduct of a large-scale field test of the MRC has provided a great deal of information concerning the course in particular, and motorcycle rider education in general. The points below summarize the important results and conclusions of this study:

- The MRC provides a comprehensive program of instruction that effectively develops the basic skills and knowledge required for street riding.
- The MRC is administratively feasible in terms of its schedule, costs, and demands placed upon instructors, students, and facilities.
- Students and instructors found the MRC to be a valuable and enjoyable experience.
- School administrators and parents approve of the course and would like to see it continued in their school system.
- In a course for novice riders, on-street training, while perhaps a desirable option, is not required to develop entry-level skills and knowledge.
- Quality motorcycle rider training does not need to be "given away"--students are more than willing to pay a modest course fee.
- Course applicants with some riding experience can be pre-tested and assigned to a shorter version of the course, if they can demonstrate mastery of certain very basic skills.

- Results of the Licensure Study indicate that offering the MRC through selected high schools did not increase the motorcycle licensure rate for students in these schools.
- Results of the Exposure/Transportation Mobility study suggest that availability of the MRC did contribute to an increase in licensure rate for the group surveyed. The results of this study also indicated that use of a motorcycle provided licensed MRC graduates with increased transportation mobility.
- Incentives and/or requirements for novice riders to enroll in MRC training programs should be given serious consideration--relatively few riders will enlist in such programs on a completely voluntary basis.

## RECOMMENDATIONS

While the results of the MRC Field Test are generally positive, there are, nonetheless, a number of steps that should be taken to improve the countermeasure potential of the MRC. Recommendations to this effect are summarized below.

### Curriculum Revisions

Throughout conduct of the MRC Field Test, students scored poorly on the last two exercises of the Motorcycle Operator Skill Test (MOST) (Exercise 8--Obstacle Turn and Exercise 9--Quick Stop-Curve).

The safety criticality of these two skills--evasive turns and braking in a turn--has been demonstrated in the California Accident Factors Study [1]. Therefore, additional research should be undertaken to develop and test improved training exercises for these two skills.

Once such training has been developed, the current MRC exercises that address these skills should be revised.

### Curriculum Additions

During the past four years, a number of important motorcycle safety research and development efforts have been completed. As appropriate, the results of these efforts should be included in the MRC. For example, the

motorcycle safety implications of work in the following areas should be reflected in the MRC curriculum:

1. Motorcycle Accident Factors.
2. Operator and Motorcycle Conspicuity.
3. Safety Helmet Effectiveness and Usage.

While the above list is by no means complete, it suggests areas in which key findings regarding safe motorcycle operation have been specified.

Incorporation of new safety information in the MRC would not necessarily require addition of new course sessions. Rather, existing sessions should be reviewed to identify content that is, vis-a-vis this new information, of lower safety criticality.

For example, as discussed in the Results Section, two of the MRC Classroom Sessions (Session 1--Introduction and Session 19--Selection, Insurance, and Maintenance) present little safety-critical information, and received low evaluation ratings from most students. The current contents of these sessions could be reduced, or eliminated, to make room for information of greater salience to motorcycle safety.

Likewise, the content of certain Range Sessions could be revamped to permit greater emphasis on the types of safety-critical skills tested by the MOST.

## SECTION 2

### INTRODUCTION AND PROJECT OVERVIEW

#### Introduction

With ever increasing transportation costs, the motorcycle has become an attractive mode of transportation to a broad spectrum of the American population. This has resulted in a substantial gain in the number of novice motorcyclists on the roads. Unfortunately, though not surprisingly, it is these riders with relatively little motorcycling experience who are most likely to be involved in accidents.

Specifically, data from a number of studies reveal that a relatively high proportion of accidents occur during the first six to twelve months of riding [1, 2, 3, 4].\* While precise quantification of prior riding experience is difficult for definitional and self-report reasons, review of these studies suggests that from 30 percent to 40 percent of all accidents involve riders with less than 12 months of street-riding experience.

In response to this problem, the National Highway Traffic Safety Administration (NHTSA) and the Motorcycle Safety Foundation (MSF), through a cooperative agreement [5], have sponsored development and testing of a thorough, performance-based, motorcycle safety education curriculum for novice riders [6, 7, 8, 9, 10].

As described in the above-referenced reports, this design process involved four major steps:

1. Analysis of motorcycle operator tasks.
2. Determination of instructional objectives.
3. Specification of curriculum structure and content.
4. Design of instructional methods and materials.

The output of this process was the Motorcycle Rider Course (MRC), first published by MSF in 1976.

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\*Numbers in brackets designate references provided at the end of this report.

## Project Overview

In the Summer of 1977, NHTSA awarded Applied Science Associates, Inc. (ASA) a contract entitled "Field Test Evaluation of a Motorcycle Safety Education Course for Novice Riders." The purpose of this study was to subject the MRC to a large-scale field test, in order to permit evaluation of the following:

- Instructional Effectiveness--Do students Acquire the skills and knowledge specified in the course objectives?
- User Acceptance--Do school administrators, instructors, students, and parents approve of the course?
- Administrative Feasibility--Is the course practical in terms of its schedule, costs and demands placed upon instructors, students, and facilities?

Additional objectives were: specification of course/curriculum revisions designed to address problems revealed by the above evaluations, and developments of a study plan for assessing the MRC as part of a NHTSA demonstration project, i.e., a study that would evaluate the real world effects of the MRC as an accident countermeasure.

As work on the project proceeded, additional research needs surfaced. These included:

- Evaluation of the need for actual on-street training.
- Development of procedures by which students with some riding experience could be "pre-tested" prior to course assignment.
- Development of a shorter version of the course (12 hours) for students who demonstrate acceptable pre-course skills.
- Assessment of the effect of charging a course fee.
- Determination of the extent to which newly-licensed riders would voluntarily take the MRC.
- Conduct of a Licensure Study to determine if offering the MRC to high-school students increased their rate of motorcycle licensure vis-a-vis students for whom the MRC was not available.
- Evaluation of a survey of MRC graduates to determine their motorcycling exposure and the transportation mobility benefits of motorcycle riding.

From September 1977 through October 1979, fifty class sections (approximately 12-14 students per section) of the MRC were conducted through the Jefferson County Public School system, located near Denver, Colorado. Over 600 students, ranging in age from 16 to 72 were enrolled in the course. Figure 2-1 provides an overview of the project.

The Licensure and Exposure/Transportation Mobility studies referenced above were conducted in the Spring and Summer of 1981.

The remainder of this report is organized as follows:

- Section 3 - Field Test Conduct.
- Section 4 - Results/Discussion.
- Section 5 - Recommendations.
- References.
- Appendices.

During 1980, as a corollary to the Field Test of the Motorcycle Rider Course (FTMRC), ASA conducted an evaluation of revised training exercises for braking and turning maneuvers. The results of this study are provided in Appendix C.

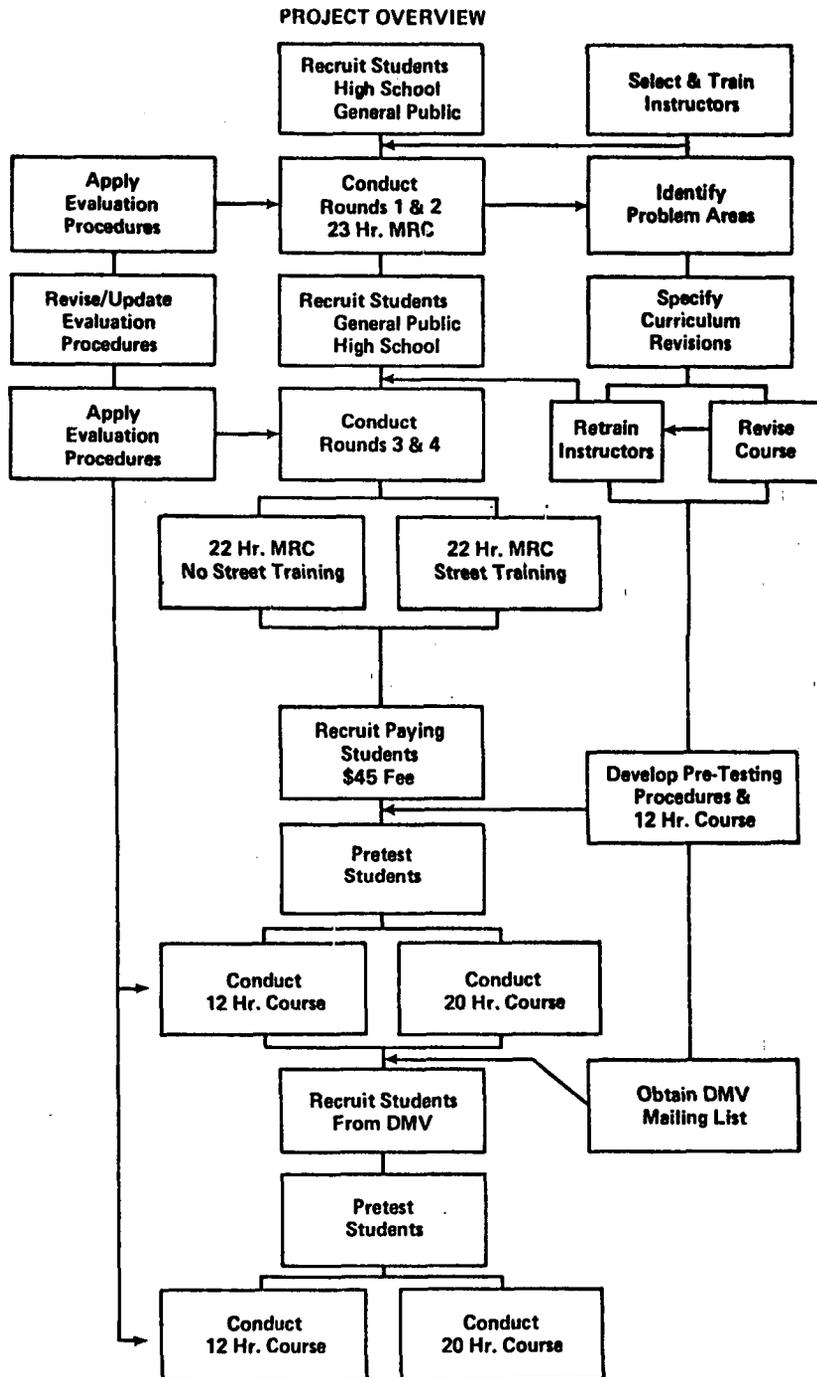


Figure 2-1  
Project Overview

## SECTION 3

### FIELD TEST CONDUCT

#### DEVELOP EVALUATION PROCEDURES AND MATERIALS

The first major project task was development of procedures and materials with which to evaluate the MRC. Conduct of this task is described in the subsections that follow.

##### Develop Evaluation Model

To structure and focus evaluation activities, an evaluation model was developed. This model, presented in Figure 3-1 was a straightforward Input-Process-Output conceptualization, with administrative and cost data applying to the system as a whole. To systematically evaluate the MRC, it was necessary to obtain measures of all three phases--Input, Process, and Output. The measures for each phase (assessment components) are listed under their corresponding phase in Figure 3-1. In addition to these three phases, overall data concerning administrative feasibility and course costs would be collected.

Inputs to the system are the students with their accompanying backgrounds, experiences, attitudes and skills. The process phase of the system consists of the MRC with its sessions and range exercises, plus all the interactions between students, instructors, and course content that accompany the instructional process. Finally, system outputs are the entry-level riders at the end of the course.

##### Develop Evaluation Materials

Procedures and instruments designed to address the three evaluation components of the project were developed. To the extent possible, previously tested evaluation instruments, e.g., performance tests, were utilized. In a number of instances, however, it was necessary to develop assessment procedures tailored to the needs of the project.

The evaluation procedures used in the FTMRC are summarized by evaluation area below. Representative copies of selected evaluation instruments are provided in Appendix A.

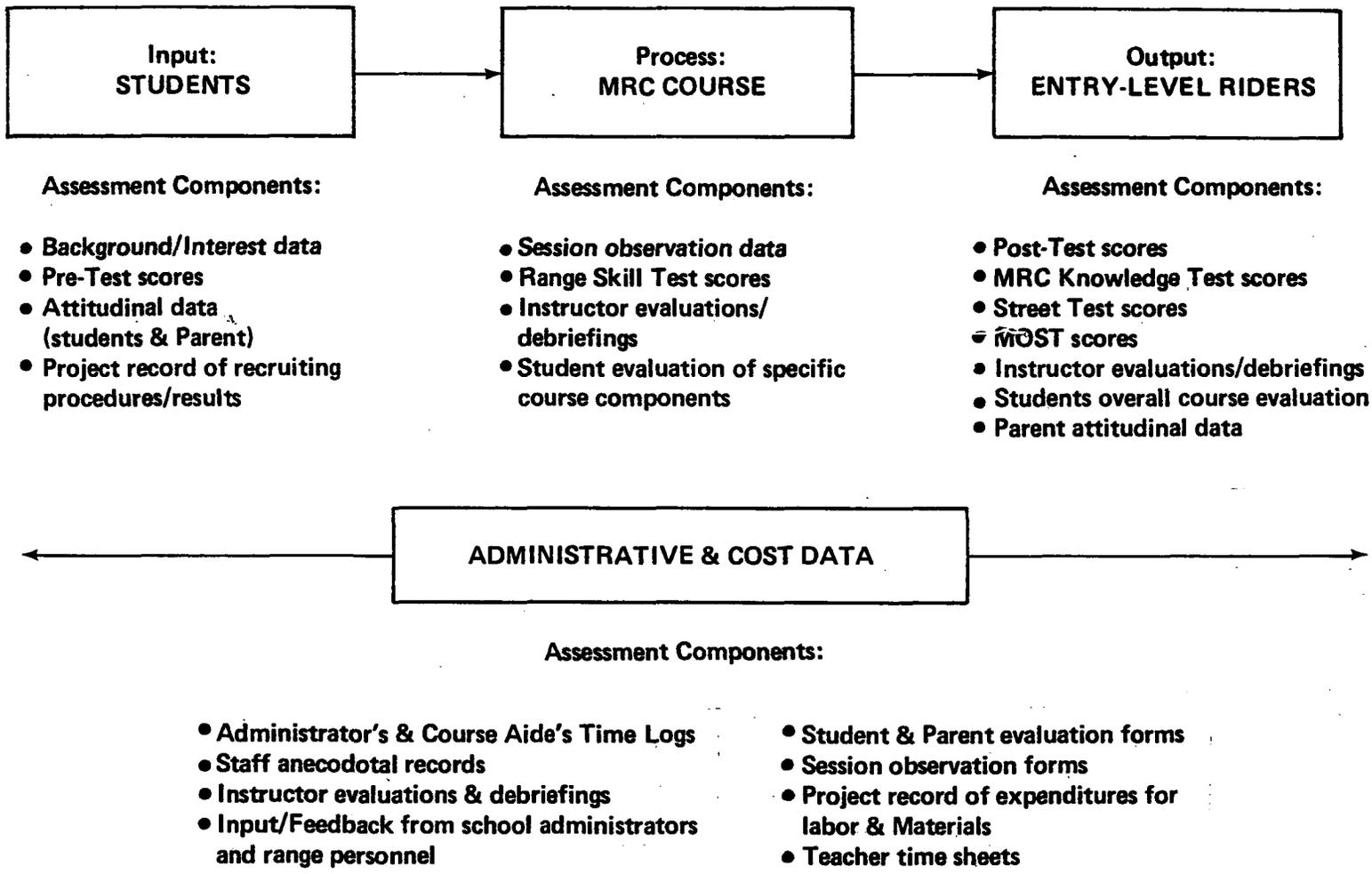


Figure 3-1. Evaluation Model

## Instructional Effectiveness

Evaluation measures used to assess instructional effectiveness included the following instruments:

1. Knowledge Tests--Tests of motorcycle-related knowledge were administered to students in a pre-post fashion, (i.e., prior to the course and again following the course).
2. Range Skill Test--A mid-course performance test that measures basic skills, e.g., use of controls, shifting, slow speed maneuvers, was administered.
3. Session Observations--Data collection instruments were developed which permitted documentation of student progress within each of the 23 one-hour sessions of the Motorcycle Rider Course. These forms also were used to rate instructor adherence to course guidelines.
4. Motorcycle Operator Skill Test (MOST)--A performance test that measures intermediate to advanced riding skills, e.g., rapid stopping and evasive maneuvers, was used at the end of the course.
5. Motorcyclist in Traffic Test--An end-of-course performance test was administered on a preselected street route to assess street riding skills, e.g., use of signals, lane placement, response to roadway characteristics and traffic situations.
6. Instructor Evaluations--Structured evaluation forms for each session of the course were completed by each instructor. Instructor input and feedback regarding the effectiveness of course content were also obtained through end-of-course debriefings.
7. Student Evaluations--Students also completed evaluation forms that permitted them to rate the instructional effectiveness of each session of the course, as well as the course as a whole.

## User Acceptance

The acceptability of the course to students, parents, teachers, and school administrators was evaluated through use of the following instruments:

1. Student Opinion/Attitude Questionnaires--Student's opinions and attitudes towards all aspects of the instructional program, e.g., facilities, teachers, schedules, content, course fee (if applicable), were

solicited through the use of structured and unstructured questionnaires administered at the end of the course.

2. Parent Opinion/Attitude Questionnaires--Parents of the high school students enrolled in the course were queried regarding their impressions of the course and the appropriateness of offering motorcycle training through the public schools.
3. Teacher Debriefings--Informal, small-group debriefings were held with teachers several times during the course. Problems with any part of the instructional program were discussed and recommended solutions were solicited.
4. School Administrator Meetings--Meetings with key school administrators, i.e., Director of Curriculum Planning, Director of Driver Education and Driving Range Supervisor, were conducted to obtain their input and feedback regarding the acceptability of the Motorcycle Rider Course and potential problem areas.

#### Administrative Feasibility

Evaluation of offering the MRC on a large-scale basis through the public schools was assessed by the following instruments:

1. Staff Time/Task Logs--Each member of the project team (e.g., Project Director, course mechanic) documented the time spent on each major project activity and problems encountered in carrying out these activities.
2. Project Cost Records--All labor and material costs associated with each aspect of conducting the MRC were recorded.
3. Input/Feedback from Administrators--Throughout the project, input and feedback concerning all administrative aspects of the project were solicited from school administrators.

#### COURSE CONDUCT/EVALUATION

After developing the evaluation procedures and materials, conduct and evaluation of the MRC commenced. These activities are described in the subsections that follow.

### Select and Prepare Instructors

ASA originally proposed to employ Jefferson County Driver Education Instructors to teach the MRC. Given a pool of over 50 such instructors, it was believed that the required number of MRC instructors could be recruited from this group. However, only two Driver Education teachers signed up to teach the MRC.

To address this short fall, a new recruitment effort which addressed all Jefferson County teachers was mounted. This effort resulted in applications from a number of very interested teachers. Although not Driver Education instructors, most of these individuals had a great deal of motorcycle-riding experience, and they indicated a keen interest in motorcycle-rider education.

All applications were reviewed, and a final pool of ten candidate instructors were selected to participate in instructor preparation activities. This final group included two Driver Education instructors and eight Jefferson County teachers from a wide-range of high school curriculum areas.

The instructor preparation workshop for the FTMRC was held at the Jefferson County driving range during late August 1977. The workshop was conducted by staff from the Motorcycle Safety Foundation (MSF), and was divided into two major activities: curriculum training and student teaching. Three days were spent covering the instructional content and procedures of the MRC. Following this, 22 students were enrolled in the MRC for purposes of providing candidate instructors with student teaching experience. The students were divided into two groups and received the MRC instruction over a period of five days. Instructors were divided into two groups and alternated teaching different classroom and range sessions of the course.

Instructors were videotaped and formally evaluated by one MSF member, one ASA member, and at least one other candidate instructor. After teaching a session, instructors viewed the videotapes and discussed reviewer's comments. At the conclusion of instructor preparation, MSF staff recommended that all ten candidates become certified MRC instructors.

### Prepare Range Facilities and Acquire Required Materials

The Jefferson County driving range used in the FTMRC was large enough to accommodate three complete MRC range layouts (see Exhibit 3-1). All three ranges were configured according to the specifications provided in Section 4 of the MRC Instructor's Guide.

A motorcycle storage shelter was constructed within an area of the range complex surrounded by a security fence. The area, also used for driver education car storage, was located within 100 feet of the MRC ranges. This location allowed students to select and transport their motorcycles to the range without significant time delays. The shelter was

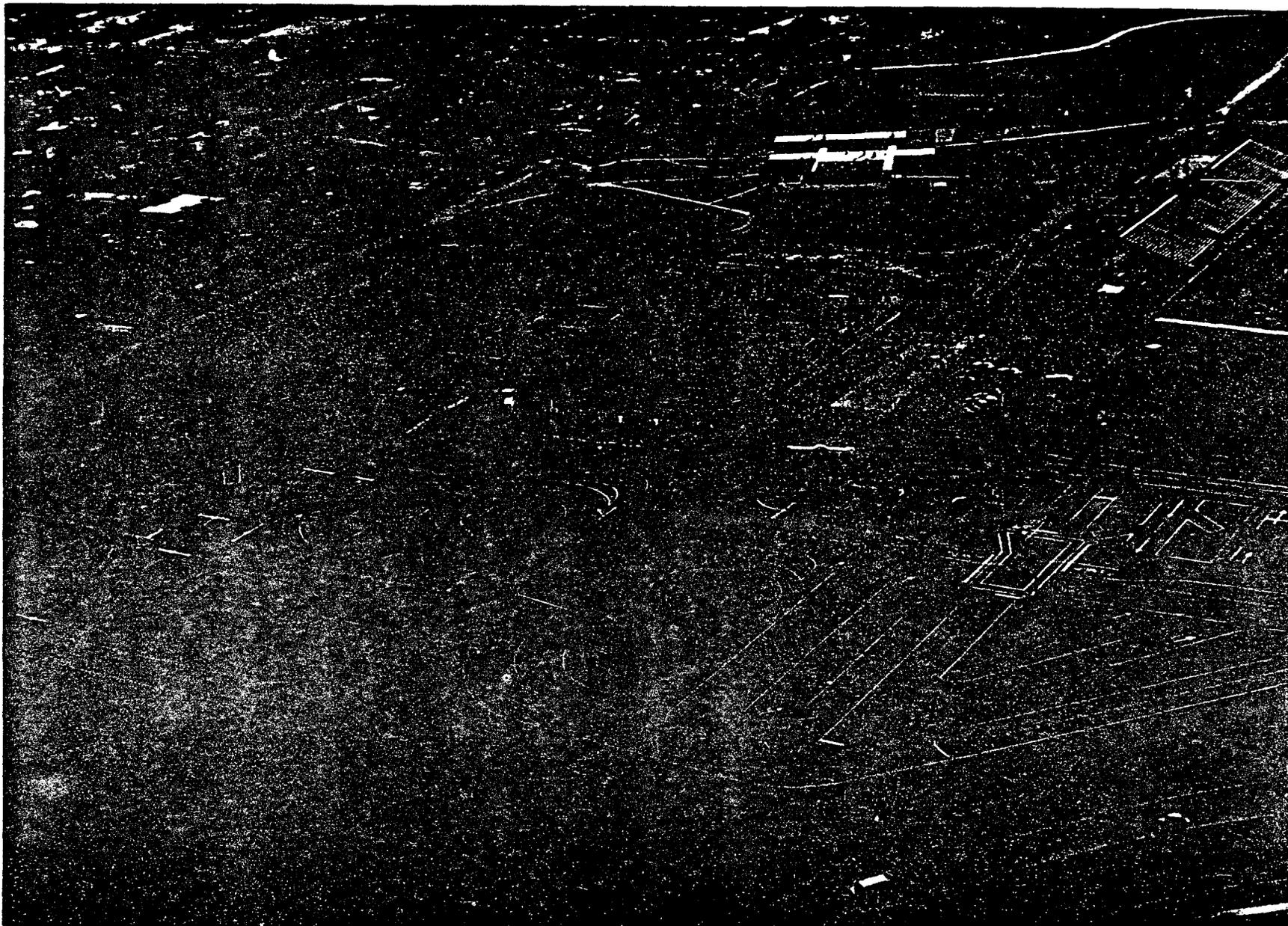


Exhibit 3-1: Jefferson County Range Facility

designed to house thirty motorcycles and allow for easy parking and movement of the motorcycles. Helmets and student vests were also stored in the shelter. This arrangement allowed students to get their vest and helmets at the same time as getting their motorcycles.

Motorcycles of 100cc to 175cc displacement were secured through the MSF Dealer Loan Program. A total of 30 motorcycles, representing all four of the manufacturers that participate in the loan program (Honda, Yamaha, Suzuki, and Kawasaki) were secured.

During the program preparation period, all other materials and services required to conduct the MRC were obtained. These items, specified in Section 4 of the MRC Instructor's Guide, included helmets, numbered rider vests, tools and spare parts, and insurance coverage. In addition, Motorola one-way communication gear was obtained. This equipment consisted of four transceivers (for key instructors), twenty-eight receivers and "pillow speakers" (worn by students inside their helmet), charging units and equipment to adapt the instructor transceivers to on-cycle use (for teacher-student communication during on-street sessions).

#### Conduct of Round 1

The course offerings in the FTMRC were grouped into "rounds." During each round, anywhere from six to twelve sections of the MRC (with approximately 12 students per section) were conducted. Overall, the FTMRC consisted of six separate rounds of course offerings. For purposes of this report, the rounds have been grouped as follows: Round 1, Round 2, Rounds 3 and 4, and Rounds 5 and 6. This grouping provides a logical presentation of project conduct that is based on the unique within-round activities that occurred, and the course revisions that were made after each of certain rounds.

Conduct of Round 1 involved five major tasks which are described below.

#### Design Course Schedules

The FTMRC was conducted through a public high school system, and the initial emphasis of the project was on high-school students. Given this population, it was possible to schedule MRC classroom sessions during the school day; however, range availability prevented scheduling the start of classes prior to 2:00 p.m.

A second factor influencing schedule design was the fact that the 23-hour MRC with on-street training (three hours on-street) was to be used in the FTMRC. Equipment availability (i.e., motorcycles, communication gear) and instructor availability were also factored into the design of course schedules.

During Round 1 of the FTMRC, four basic course schedules were employed. A summary of these schedules is provided in Table 3-1.

Table 3-1

Alternative Course Schedules

<u>Type of Schedule</u>	<u>Time of Day</u>	<u>No. of Days/Week</u>	<u>Total No. of Weeks</u>
"In-School"	2:00-3:00 p.m.	5 weekdays	5
"After-School"	3:00-5:00 p.m.	2 weekdays	6
"Concentrated"	3:30-5:30 p.m.	3 weekdays	2-1/2
	and		
	8:00 a.m.-1:00 p.m. or 12:00 n.-5:00 p.m.	Sat. or Sun.	2-1/2
"Weeknight/Weekend"	9:00-11:00 a.m. or 11:00 a.m.-1:00 p.m. or 1:00-3:00 p.m. or 3:00-5:00 p.m.	Sat. or Sun.	5

The scheduling options presented in Table 3-1 permitted most students to take the MRC without seriously disrupting other activities in which they were involved.

Recruit/Enroll Students

Recruitment efforts for Round 1 of the FTMRC included the following:

1. In-school announcements made by administrative and teaching personnel at selected Jefferson County High Schools.
2. MRC posters displayed in Jefferson County High Schools, motorcycle dealerships, and public areas.
3. News releases distributed to selected Denver-area radio stations.

These recruitment efforts resulted in close to 200 course applicants. A total of 155 students were actually enrolled in one of 14 course sections offered in Round 1.

Conduct Round 1 of Course Offerings

Round 1 ran according to schedule beginning on September 19, 1977 and concluding on October 30, 1977. The weather was mild throughout the period

and all classes were held as scheduled. The points below describe unique events that occurred during conduct of the first round of courses offered in the FTMRC:

1. Round 1 was the first time instructors had taught all sessions of the MRC on their own. Discussion between ASA staff and instructors concerning the curriculum, instructional methods and course materials was a common event.
2. It required a few weeks for the course mechanic to become totally familiar with the idiosyncrasies of the loan motorcycles. Starting procedures, operational characteristics and likely malfunctions were different for each kind of motorcycle.
3. One instructor discontinued teaching towards the end of Round 1--a substitute instructor replaced him. The instructor who quit apparently decided he was no longer interested in teaching the MRC.
4. Motorcycle availability for street sessions became a problem when paperwork necessary for licensing the motorcycles was delayed. Due to this delay, certain students were unable to take the motorcycle they preferred out on the street.

Of the 155 students who started the course, a total of 109 (70.3 percent) completed all course requirements.

#### Collect Evaluation Data

The evaluation materials described previously were used to collect data during Round 1 of the FTMRC. Data collected with these instruments appears in this report's Section 4, Results/Discussion. The points below review the evaluation materials, and describe data collection procedures which were employed:

1. Student Application Forms. Application forms were typically collected during the student recruitment/enrollment effort. This form called for course section preferences, as well as biographical information (e.g., age, prior riding experience). Due to late enrollment, a few students did not complete this form until the first class meeting.
2. Pre/Post Knowledge Tests. Knowledge tests adapted from the Motorcycle Operation Manual (MOM) were administered to students during the first class session, and an alternate form of the test was administered during the last class session.

3. Range Skill Test (RST). Instructors administered the RST following Session 8 of the MRC. Students were required to pass the RST before proceeding with the remainder of the course. Students who failed the test were provided up to one hour of remedial instruction and then permitted to take the test a second time. ASA staff routinely co-scored instructor administration of the test. This served to ensure that all instructors were administering the test in the prescribed fashion. After the class completed the RST, the ASA staff member would compare student scores with the instructor. Discrepancies were infrequent and, through discussion, the possible source of difference was usually resolved.
4. Session Observations. Using specially-prepared data collection forms, ASA staff observed and documented the conduct of a sample of all instructors, course sections, and MRC sessions. These forms permitted detailed documentation of the extent to which students mastered specified within-session objectives, and the degree to which instructors adhered to course guidelines. Overall, during Round 1, close to 50 percent of all course sessions were observed by ASA staff. Many of these sessions were also videotaped for later review/evaluation.
5. MRC Knowledge Test. The MRC Knowledge Test was administered on the last classroom meeting. Students who were absent had to complete the test at some later date in order to complete the course.
6. MRC Street Test. The MRC Street Test was administered by the instructor at the end of the course. The test was administered in strict accordance with the guidelines presented in the MRC Instructor's Guide. Each student rode a prescribed route and was followed by his/her instructor, who was also on a motorcycle. The instructor used the previously-described communication gear to provide the student with instructions. (During later Rounds of the FTMRC, the Motorcyclist In-Traffic Test was substituted for the MRC Street Test.)
7. Motorcycle Operator Skill Test (MOST). The MOST was administered at the end of the course by an ASA staff member who had received extensive training on conduct and evaluation of this test. All tests were administered according to the guidelines provided in the MOST Administrator's and Examiner's Guides.
8. Student Evaluation Forms. Students completed three evaluation forms, covering the following: MRC Sessions 1-10, MRC Sessions 1-23, and overall course evaluation. The first form was completed during Session 10, the last two forms were completed at the end of the course.

9. Parent Questionnaires. Questionnaires designed to collect information on parental acceptance of the MRC were mailed to the parents of Round 1 students following completion of all courses.
10. Instructor Evaluations. Instructors completed course evaluation forms following their conduct of each MRC session. They also completed an overall evaluation form at the end of Round 1. In addition, two instructor debriefings were conducted: one midway through Round 1 and the second at the end of Round 1. These debriefings, conducted by ASA staff, permitted the instructors to provide additional input/feedback concerning course content and procedures.

The evaluation data described above were filed and stored on a routine basis. Data that lent itself to computer processing were coded and entered for later analysis.

#### Review Results/Implement Procedural Modifications

Based on the experience of conducting Round 1, ASA staff reviewed all course administration procedures. ASA also reviewed the content and instructional methods in all MRC sessions. To assist in this effort, instructors were asked to critique all sessions of the MRC.

Instructors critiqued classroom sessions through a structured "Instructor Input/Feedback Evaluation Form." In addition, individual classroom and range sessions were critiqued at group discussion meetings ("debriefings"), consisting of instructors and ASA personnel. Debriefings took place shortly after the instructors had taught the classroom or range sessions to be discussed.

Much of the instructor feedback confirmed what other data also indicated--areas which needed clarification, expansion, or simplification. Suggested areas of change were identified and classified into the following categories:

- . Areas requiring change before the conduct of Round 2--major areas included the need to place a greater emphasis on use of the front brake and on countersteering. Revised exercises were developed to address these two areas. Minor discrepancies in the Instructor's Guide were also identified. Instructors were briefed on changes to be implemented prior to Round 2, and pencil corrections were made in individual Instructor's Guides.
- . Areas subject to change after Round 2--suggestions that pertained to instruction in a different sequence or substantially changing the materials in the Instructor's Guides. While curriculum modifications were not made at

this time, these "areas of concern" were earmarked for attention during the conduct of Round 2.

- Areas not subject to change--certain instructors felt that some course activities unique to the FTMRC (e.g., MOST, student evaluation form) were burdensome to students. It was explained that these measures must be applied for purposes of the field test and, therefore, could not be modified.

Once the above areas had been addressed, work proceeded on preparations necessary for the conduct of the Round 2 course offerings.

### Conduct of Round 2

As described below, conduct of Round 2 of the FTMRC involved tasks similar to those conducted during Round 1.

#### Specify Course Schedules

The four basic course schedule configurations employed in Round 1 were also used in Round 2. The number of sections that were offered for each type of configuration is outlined in Table 3-2, below.

Table 3-2

#### Course Configurations Employed During Round 2

<u>Type of Schedule</u>	<u>No. of Sections Offered</u>	<u>No. of Sections Conducted</u>
"In-School	2	2
"After-School	4	3
"Concentrated"	2	1
"Weeknight/Weekend"	<u>5</u>	<u>5</u>
Total	13	11

As indicated in Table 3-2, a total of 13 sections of the course were offered during Round 2. Two sections (one "After-School" and one "Concentrated") did not achieve adequate enrollment and were, therefore, cancelled. Students who had enrolled in these cancelled sections were able to be accommodated in one of the 11 sections that were conducted.

## Recruit/Enroll Students

Student recruitment activities in Round 2 were similar to those used for Round 1. In addition, new types of recruitment activities took place during the conduct of Round 1. The points below list student recruitment activities used for Round 2.

- . Students who responded to Round 1 recruitment efforts, but who were unable to be enrolled in Round 1, were mailed a course schedule for Round 2.
- . Posters placed in public areas were updated with the Round 2 recruitment information (dates when the course was offered, where to call or write, etc.).
- . Display ads were again run in local newspapers.
- . Announcements were again made at local Jefferson County high schools.
- . An information/registration booth was set up at the annual Lakewood Community Fair. The fair was held at the Jefferson County Driving Range, and provided another opportunity to enroll students in the MRC. Although our presence at the fair did not result in a large number of applications, a great deal of information was handed out which contributed to the community's awareness of the MRC.
- . Two local stations, KBTV and KMGH-TV, aired news coverage describing the FTMRC. KBTV, Denver's "leading" television station, ran a week-long news commentary concerning motorcycling in the Denver area. During this series, Mike Landess, KBTV's news anchorperson, portrayed different aspects of motorcycling and various safety problems faced by motorcycle riders. Coverage of the MRC was presented on the last day of the series, and presented the course as a positive activity which could help reduce the number of motorcycle accidents.

The recruitment activities outlined above resulted in over 150 course applicants. A total of 141 students were actually enrolled in the 11 course sections offered during Round 2.

## Conduct Round 2

Round 2 was conducted according to schedule, beginning on 31 October 1977 and concluding on 11 December 1977. The points below describe important events which occurred during the conduct of Round 2:

- . The experience that the instructors gained in teaching Round 1 courses was evidenced in their conduct of Round 2

courses. ASA observed an overall increase in the quality of instruction, and an improvement in the ways in which instructors handled administrative aspects of the MRC.

- . The temperature during Round 2 occasionally dropped below 40 degrees Fahrenheit. Students were previously advised to dress warmly, which they did. In general, the cold temperature did not grossly affect student performance.
- . The onset of darkness occurred shortly after 5:00 p.m. during November and December. Although Round 2 was scheduled to avoid darkness, range instruction occasionally had to terminate early. That is, if a class started late for any reason, the practice of running a little longer than scheduled was not always possible during Round 2.
- . During the month of December, it was necessary to re-schedule three days of course work due to severe winds. Rescheduling was accomplished in various ways. If class time could be extended the next time the class met, missed course activities were made up then. More frequently, attempts were made to substitute classroom sessions when the weather prohibited riding on the range or street. If all else failed, classes were cancelled and activities were postponed to a later date.

#### Collect Evaluation Data

The evaluation procedures employed during Round 1 were also utilized during the conduct of Round 2.

The resulting evaluation data were filed on a routine basis, and data that lent itself to computer processing were coded and entered for later analysis.

#### Interim Data Analysis/Course Refinement

The output of Rounds 1 and 2 provided a wealth of evaluation data concerning the MRC. It was determined that an interim analysis of these data should be conducted, and that the course should be refined as indicated by the results of these analyses. Additional rounds of course offerings would then be conducted to permit assessment of these course modifications.

Analyze Evaluation Data  
From Rounds 1 and 2

The evaluation data collected during Rounds 1 and 2 were summarized and analyzed. The results of these analyses indicated that, at this point in the project, the evaluation analysis should center on the instructional effectiveness of the MRC.

The 23-hour MRC that was under study consisted of eleven hours of classroom instruction ("classroom sessions") and twelve hours of on-cycle instruction on the driving range ("range instruction").

Each of the eleven one-hour classroom sessions has performance objectives which are specified in the MRC Instructor's Guide. Each of the twelve one-hour range sessions were broken down into exercises, with exercises being anywhere from five minutes to 50 minutes in length. Each of these range exercises has associated performance objectives which are also specified in the MRC Instructor's Guide.

As described earlier in this section, ASA developed data collection instruments that permitted detailed documentation of the extent to which students actually met these performance objectives (see Exhibits 3-2 and 3-3). Accordingly, during the interim data analysis, the data provided by these instruments were carefully evaluated vis-a-vis the corresponding performance objectives.

In addition to evaluating the MRC on a session-by-session basis, the data provided by the following instruments were carefully analyzed: knowledge tests, range skill test, motorcycle operator skill test (MOST), MRC street test, instructor evaluations and student evaluations. The result of these evaluations are provided in Section 4 of this report. These data were used to identify sections of the MRC that should be revised.

Specify Curriculum Revisions

The output of the above activity was used to produce an Evaluation Report that provided evaluation data for each of the MRC classroom sessions and each of the MRC range sessions and associated range exercises.

This report was presented and reviewed at a working meeting conducted at NHTSA headquarters in Washington, DC. Participants in this meeting included the NHTSA CTM and other NHTSA motorcycle safety specialists, ASA project staff and representatives from the MSF Education Department.

As a result of this meeting, it was determined that a number of curriculum modifications should be made. Briefly, these modifications included:

- . Changing the time allocations for particular range exercises.
- . Reordering the sequence of certain range exercises.

RANGE OBSERVATION RECORD  
 Session 17 Exercise 30

Date \_\_\_\_\_  
 Observer \_\_\_\_\_  
 Section # \_\_\_\_\_  
 Instructor \_\_\_\_\_  
 Range Inst. \_\_\_\_\_  
 Number of Students  
 Present \_\_\_\_\_  
 Absent \_\_\_\_\_

**STOPPING ON A CURVE**

Time: 20 min.

Time Spent: \_\_\_\_\_

**OBJECTIVE**

Students must be able to bring the motorcycle to a stop on a curved path.

**DIRECTIONS**

1. Assign 2 riders to each 60' circle. Instruct the other riders to observe from the side.
2. Instruct the students to do the following:
  - a. Ride around the circle to the right at 15 mph.
  - b. Stop at the designated points on the circles.
3. Switch groups and repeat exercise until all students have participated.
4. Reverse direction — repeat exercise.
5. Stop exercise and instruct the students to line up in two rows of six. Give instructions for the next exercise.

<input type="checkbox"/>	_____

**COACHING TIPS**

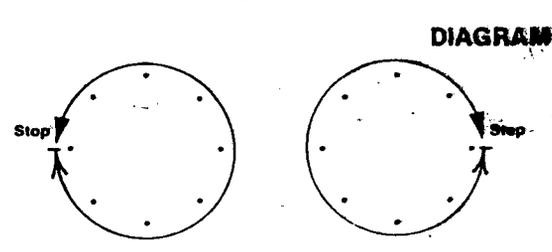
1. Watch speed carefully.
2. Inform students of the danger of rear wheel skid in a leaning attitude.
3. Caution students that braking while turning to the right is more difficult than while turning to the left because the right foot tends to slide off the rear brake. Do not perform the exercise to the right until all riders have successfully completed it to the left.
4. Later instruct the students to stop on your command.

<input type="checkbox"/>	_____

**STUDENT EVALUATION**

Rating Scale: 0 - Not Observed, X - Inadequate, ✓ - Adequate

St. #	1. Stops using both brakes	2. Neither tire skids	3. Stays within 3' of the circle	4. Keeps head and eyes up	5. Feet on pegs



NOTES: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**CLASSROOM OBSERVATION RECORD**

SESSION 1

Date \_\_\_\_\_  
 Observer \_\_\_\_\_  
 Course \_\_\_\_\_  
 Instructor \_\_\_\_\_

**Rating Scale:**

- 0 - Not Observed
- X - Inadequate
- ✓ - Adequate

**EVALUATION/RATING**

SESSION CONTENT COMPONENTS	EVALUATION/RATING				Comments, Problems
	Content Coverage	Instructor Activities	Use of Materials	Time Spent (Mins.)	
A. Intro Remarks/Film					
B. Purpose of Course					
C. Overview/Film Strip					
D. Controls					
				Total Time	

OVERALL RATINGS FOR SESSION (Check Appropriate Box)	Comments, Problems				
	Good	Adequate	Poor	Not Performed	Not Applicable
1. Introduction/Overview of Session					
2. Instructor(s) Elicits Class Participation					
3. Student Interest/ Involvement					
4. Session Transition (e.g., Range Prep., Homework Assignments)					
5. Overall Session Quality.					

Exhibit 3-3

Classroom Observation Record

- . Developing new curricula for important skills that were not covered in the original curriculum, e.g., starting on a hill.
- . Modifying the existing curriculum to place more emphasis on particular skills, e.g., emergency stopping and evasive maneuvers.
- . Shortening certain classroom sessions that were overly long and cumbersome.
- . Including additional safety-relevant information in selected classroom sessions (e.g., additional information on the injury-reduction benefits of safety helmets).

In addition to the modifications outlined above, an important research question concerning on-street training was raised at the NHTSA meeting.

The 23-hour MRC that was field-tested during Rounds 1 and 2 included three hours of on-street training. During this training, three students and one instructor would ride preselected street routes that were in the general vicinity of the driving range. The instructor, also on a motorcycle, would follow the group of three students and issue directions through a one-way, radio system:

The results of Rounds 1 and 2 indicated that this on-street training was expensive to conduct and posed a definite threat in terms of possible accidents. Given these concerns, the value of street training, in terms of knowledge and skill acquisition, was questioned. To address this question, it was determined that the next two rounds of course offerings (Rounds 3 and 4) would include sections that provided actual on-street training and sections that attempted to simulate such training on the driving range. To compare these two training conditions, students recruited for Rounds 3 and 4 would be randomly assigned to either the "street" version of the course or to the new "no-street" configuration.

To evaluate the outcome of these two different course configurations, it was determined that NHTSA's Motorcyclist-In-Traffic Test (MIT) would be used as an end-of-course performance measure. During Rounds 1 and 2, the MRC Street Test had been administered to all students at the end of the course. However, the MIT, which was a newly-developed test, was believed to prove a more valid and reliable measure of on-street riding skills.

It was thus determined that the MIT would replace the MRC Street Test as the end-of-course, on-street performance measure.

#### Produce Revised MRC

Once curriculum revisions had been specified, work proceeded on the production of a revised version of the MRC. This was a cooperative effort involving ASA project staff and members of MSF's Education Department.

In addition to implementing the curriculum modifications outlined in the previous subsection, new "simulated street" sessions were developed. Specifically, for the "no-street" version of the course, two range sessions were developed that provided simulated traffic and simulated roadway configurations. These two-hours of instruction were designed to replace the three on-street sessions (Sessions 14, 15 and 19) in the original 23-hour MRC.

For purposes of Rounds 3 and 4, revised pages incorporating the above modifications were prepared and inserted in the MRC Instructor's Guide. (This revised version of the MRC was later published by MSF in the Spring of 1977 and is the version of the MRC in current use.)

#### Implement NHTSA Motorcyclist-In-Traffic-Test (MIT)

In preparation for comparison of the "street" versus "no-street" course configurations, the MIT was implemented on selected streets in the immediate vicinity of the Jefferson County Range Facility. MSF's Director of Licensing, an experienced MIT administrator, selected the test route and specified checkpoints for the Jefferson County MIT. The route which was used for the MIT is illustrated in Exhibit 3-4.

Following route preparation, ASA staff and the Jefferson County MRC instructors received detailed training on administration of the MIT.

#### Conduct of Rounds 3 and 4

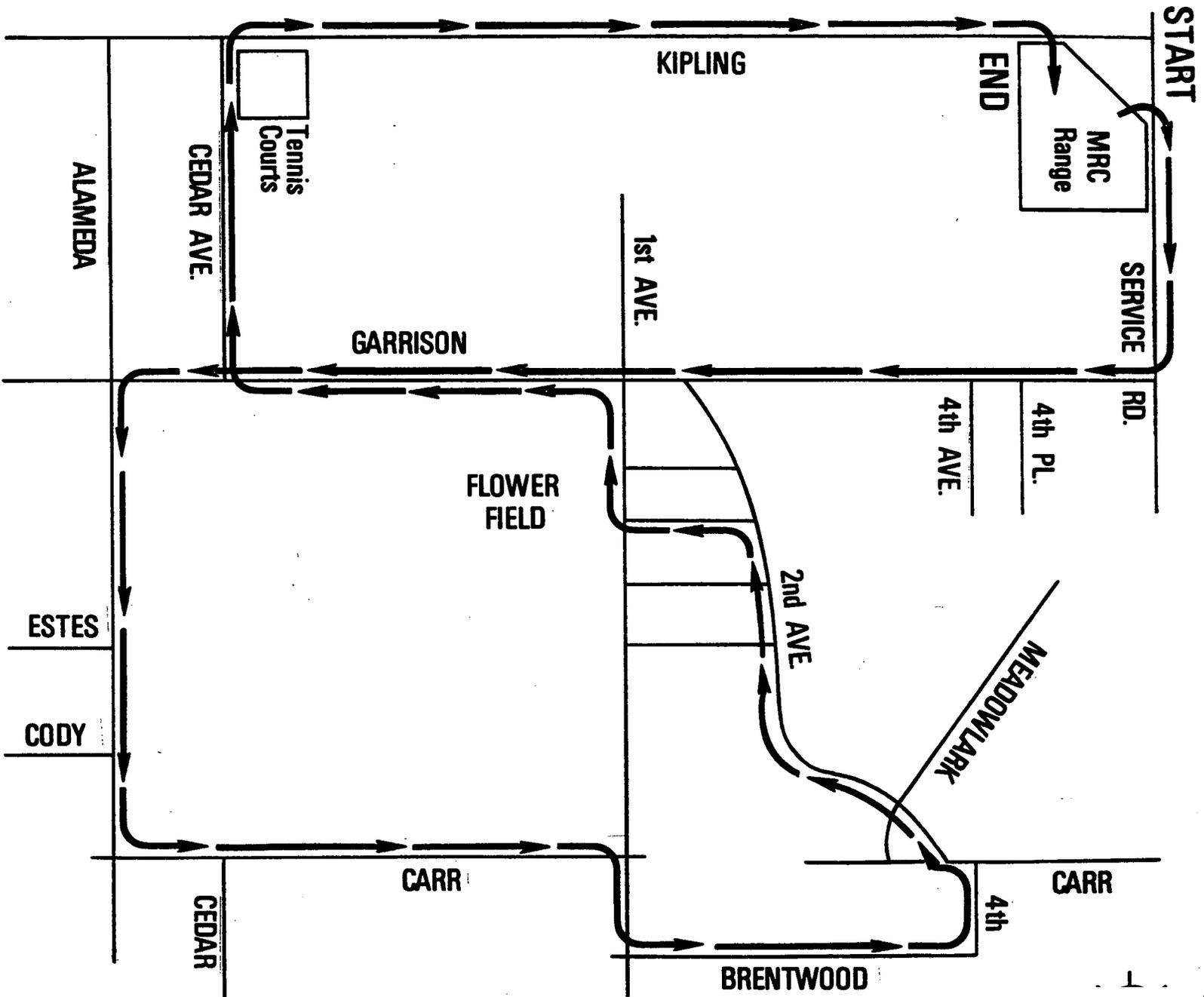
Rounds 3 and 4 of the FTMRC were offered for two basic purposes:

1. To assess the effectiveness of the course revisions that had been implemented following Rounds 1 and 2.
2. To conduct an experimental evaluation of the effectiveness of actual on-street training versus simulated on-street training.

Rounds 3 and 4 involved the conduct of five major tasks which are described below.

#### Retrain Instructors

In preparation for Rounds 3 and 4, instructors were briefed on all of the MRC curriculum revisions. Each course session was carefully reviewed with the instructors, and ASA staff led detailed discussions on all revisions. Since most of the proposed curriculum revisions were endorsed by the instructors, the revised Instructor's Guide was well received. However, some instructors did not initially support the street/no-street revisions. Certain instructors felt the street experience was something



2

that could not be replicated on the range. Nevertheless, hesitant instructors finally agreed to do their best in teaching both the street and no-street course sections.

Although most course revisions were easily assimilated by the instructors, the MIT was an entirely new student evaluation instrument to be used in Rounds 3 and 4. The newness and criticality of the MIT (as a primary comparison between street and no-street sections) required ASA staff to thoroughly train instructors on MIT administration and scoring procedures. Furthermore, due to the complexity and importance of the MIT, it was agreed that every attempt would be made to have both an instructor and an ASA staff member administer the MIT to all MRC students. This policy was established to ensure accurate administration of the MIT.

### Specify Course Schedules

In general, the course scheduling configurations employed in Rounds 1 and 2 were also utilized during Rounds 3 and 4. However, since these rounds were conducted in the late spring and summer, it was possible to add a fifth type of configuration--"After-Work." The "After-Work" schedules ran from 5:00 p.m. to 7:00 p.m. or 6:00 p.m. to 8:00 p.m., and typically met three or four weeknights a week for three to four weeks. This new configuration turned out to be quite popular with many adults who could not take the course earlier in the day and preferred to not take one of the schedules that involved weekend classes.

In specifying the course schedules for Rounds 3 and 4, special care was taken to have an equal number of "street" and "no-street" sections for each schedule configuration. This was done to facilitate random assignment to sections. Furthermore, the sections were specially coded so that only ASA staff knew which contained on-street training and which did not. This was done to prevent any selection bias on the part of students or instructors.

### Recruit/Enroll Students

Round 3 was scheduled to commence late in April of 1978. Recruitment efforts for Round 3 were similar to those employed in Rounds 1 and 2. Display ads were again run in local newspapers, posters were displayed in public areas, and announcements were made in selected Jefferson County Public High Schools.

While the recruitment campaign consisted of the same activities as before, class sections were filled much more quickly than during Rounds 1 and 2. Furthermore, there was much greater adult interest in the course than had been the case during Rounds 1 and 2.

Student response to Round 3 was so great that a waiting list quickly developed, and this list was subsequently used to fill almost all of the Round 4 courses. Therefore, recruitment efforts for Round 4 were minimal.

The strong student interest in Rounds 3 and 4 appeared to be a function of two factors:

1. Earlier offerings of the course had generated a community awareness of the MRC.
2. Interest in taking motorcycle training is stronger in the spring and summer than in the fall (when Rounds 1 and 2 were conducted).

It should also be noted that, as the course gained exposure, more and more applications were the result of "word-of-mouth" as opposed to formal advertising.

To facilitate random assignment to "street" versus "no-street" sections, the sections of the course that were announced did not specify the nature of the section (i.e., "street" versus "no-street"). This determination was made by ASA after all sections had been filled. Through this process, it was possible to establish an equal number of "street" and "no-street" sections, and to counterbalance these two types of sections across student characteristics and instructor assignments.

The recruitment/enrollment efforts described above resulted in 112 students for Round 3 and 108 students for Round 4.

#### Conduct Rounds 3 and 4

Conduct of Round 3 began as scheduled on April 17, 1978 and ran through May 26, 1978. This was the third time instructors had taught the MRC, and there was very little ASA-instructor discussion concerning unrevised portions of the course. There was discussion between ASA staff and instructors confirming the content and instructional methods of the revised course sessions. The revised sessions were presented as intended, and instructors indicated general satisfaction with the revised Instructor's Guide. The weather during Round 3 was excellent and presented no major scheduling delays.

Conduct of Round 4 began on June 19, 1978 and ran through August 11, 1978. Instructors had become familiar with the course revisions and were quite effective in teaching all aspects of the MRC. As was the case in Round 2, increased teaching efficiency may have helped students overcome severe environmental conditions. The weather during Round 4 was extremely hot (the summer of 1978 in Denver was the hottest on record). Although this did not present a major scheduling problem, student performance may have been affected by the heat.

Administration of the "street" and "no-street" course sections proceeded as planned during Rounds 3 and 4. Instructors gained experience in teaching the simulated street sessions and, as necessary, the content of these sessions was "fine-tuned."

### Collect Evaluation Data

The evaluation instruments used in Rounds 1 and 2 were again employed in Rounds 3 and 4. Particular attention was paid to the new course revisions and to the simulated street sessions (on the range). Student criterion measures used were the same as in Rounds 1 and 2 (with the exception of the MIT in place of the MRC street test).

To ensure proper conduct of the MIT, early administrations of the test were performed by both the assigned instructor and ASA staff. That is, an ASA staff member followed the instructors and students and also administered the test. Following each test, the ASA staff member reviewed the instructor's score sheets and provided corrective feedback, as necessary. This procedure was followed with each instructor until his administration of the test was completely accurate.

Upon completion of Round 4, the Round 3 and 4 data were reduced and keypunched. This new data was input to the existing file structure and evaluations were conducted (results of these evaluations are presented in Section 4 of this report).

### Course Revision/Refinement

Analysis of the evaluative data collected during Rounds 3 and 4 revealed that most of the curriculum modifications had the intended effect. The results of the "street" versus "no-street" evaluation indicated no differences between the two treatment groups. Specifically, we found no significant difference between these two groups on any of the post-course knowledge or performance tests.

Given the finding described above, and the other results of the Rounds 3 and 4 evaluations, it was determined that additional revisions to the MRC were warranted. These revisions are summarized below.

Since the on-street training sessions did not result in a noticeable improvement in street-riding skills, a decision was made to make the "no-street" version of the course the standard MRC (the on-street sessions would still be included in the Instructor's Guide, but as an option). With this objective in mind, the simulated street-training exercises were reviewed and revised to address the evaluation findings of Rounds 3 and 4. As a result of this process, certain of the simulated street-training exercises were dropped (they had proved to be ineffective) and others were modified.

Review of the other components of the MRC revealed that certain classroom and range instruction could be streamlined beyond what had been done following Rounds 1 and 2.

The modifications described above resulted in a further reduction in course length from the 23-hour course used in Rounds 3 and 4 to a basic 20-hour course that did not include on-street training. This 20-hour course,

which was used during the last two rounds of course offerings (Rounds 5 and 6), is currently the standard MRC recommended by the MSF.

### Conduct of Rounds 5 and 6

Rounds 1-4, which have been described on previous pages, constituted the mainstream of the FTMRC. Nonetheless, at the conclusion of Round 4, certain important research questions had not been addressed. Therefore, at the direction of NHTSA, ASA conducted two additional rounds of course offerings (Rounds 5 and 6) to examine the following issues:

1. The feasibility of offering a shortened version of the course (12-hours) to students with some prior riding experience.
2. The effect of initiating a course fee.
3. The extent to which newly-licensed motorcyclists would voluntarily sign-up for and take the MRC.

Conduct of Rounds 5 and 6 is summarized below. Since these rounds were smaller in scope than Rounds 1-4, description of their conduct has been abbreviated.

### Conduct Round 5

The fifth round of the FTMRC was designed to address two research questions:

1. The extent to which students with some riding experience could "test out" of the first eight hours of the MRC and successfully complete the remaining 12 hours.
2. The impact of a course fee on enrollment and user acceptance.

The first research question was concerned with tailoring the MRC to the entering behavior of prospective students. Since the first eight hours of the MRC cover very basic skills and knowledge, it was believed that students with some riding experience could skip these sessions. Such a procedure would respect individual differences and would permit course sponsors to make more efficient use of instructional resources.

The issue of a course fee was raised, since offering the MRC is a fairly expensive proposition. As reported in a separate FTMRC paper, per student costs for the MRC were found to range from \$80 to \$120. Given such costs, an important question concerned the extent to which student fees could be used to partly underwrite these costs.

A total of 83 students enrolled in Round 5 of the FTMRC. Round 5 commenced in May of 1979 and was concluded in July of 1979.

Prior to the start of the Round 5 courses, students who indicated some past riding experience were administered the first five exercises of the MOST.

These exercises are as follows:

1. Starting and Moving Up a Hill
2. Sharp Turn
3. Accelerating in a Turn
4. Slowing in a Turn
5. Normal Stop.

The above exercises test relatively basic performance skills. Students who met the passing criteria for each of these exercises were exempted from the first eight hours of the MRC and, thus, received a course of 12-hours in length.

Students with no prior experience, and those who "failed" the pre-test, were assigned to the regular 20-hour MRC. All students paid an initial course fee of \$45. Those who "tested out" of the first part of the course received a \$20 rebate.

#### Conduct of Round 6

The purpose of Round 6 was to determine the level of interest in taking the MRC among newly-licensed motorcyclists. Students recruited for Round 6 were persons in the Denver metropolitan area who had obtained a new motorcycle license endorsement during the month immediately prior to the start of Round 6. A list of these persons was obtained from the Colorado Division of Motor Vehicles. These individuals were mailed a packet of materials describing the MRC and were offered the course at no charge.

Students in Round 6 were also given the opportunity to test-out of the first part of the course. This provided the project with further opportunity to assess the feasibility of the 12-hour course.

A total of 48 students enrolled in the courses offered during Round 6. This round commenced in July of 1979 and was concluded in August of 1979.

## SECTION 4

### RESULTS/DISCUSSION

The results of the Field Test of the Motorcycle Rider Course (FTMRC) are presented and discussed in this section. The primary results of the project are organized by the three evaluation components: (1) Instructional Effectiveness, (2) User Acceptance, and (3) Administrative Feasibility. These results are discussed in the first three subsections.

The data source for these three components are the evaluations conducted during Rounds 1-4. In general, data from Rounds 5 and 6 are not included in the presentations for these three areas.\*

A fourth subsection entitled, "Street versus No-Street Training" presents the results of research designed to address the advisability of on-street training. A fifth subsection called "Other Findings" presents results pertaining to the additional research questions addressed in Rounds 5 and 6. The last two subsections ("Licensure Study" and "Exposure/Transportation Mobility Study") provide the results of two studies that were conducted to determine the post-course experience of MRC graduates.

Table 4-1 provides an overall summary of the major treatments employed in the FTMRC.

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\*Rounds 5 and 6 were conducted to address special research questions and data from these rounds are, therefore, not compatible with the data collected during Rounds 1-4. For example, during Rounds 5 and 6, unique course configurations were employed; during Round 5, students were required to pay a course fee; and, during Round 6, students were recruited from a special population (newly-licensed riders). Also, given the limited focus of Rounds 5 and 6, certain of the evaluation procedures used during Rounds 1-4 were not employed for reasons of cost.

Table 4-1

MRC Field Test Treatments

<u>Group</u>	<u>Rounds</u>	<u>Student Population</u>	<u>Course Treatment</u>	<u>Students Enrolled</u>
Mixed	1 & 2	High School & General	23 hrs.	283
Mixed	3 & 4	High School & General	22 hrs.*	209
Paying	5	General	12 or 20 hrs.	83
Licensed	6	Newly-Licensed	12 or 20 hrs.	48
TOTAL				623

\*  
50 percent received on-street training,  
50 percent received no on-street training.

As indicated in Table 4-1, a total of 623 students were enrolled in the different aspects of the FTMRC. The majority of the students were enrolled in Rounds 1-4 which constituted the mainstream of the project.

Instructional Effectiveness

Data concerning the instructional effectiveness of the MRC have been grouped in terms of the following categories:

1. Enrollment Profile.
2. Interest in Course.
3. Course Completion Data.
4. Knowledge Test Results.
5. Session Observation Data.
6. Range Skill Test Results.
7. MRC Street Test/Motorcyclist-in-Traffic Test.
8. Motorcycle Operator Skill Test (MOST).

The evaluation results for each of these categories are presented in the subsections that follow.

Enrollment Profile

Table 4-2 provides a breakdown of enrollment data by age and sex. Of the 491 students for whom complete demographic information was available, 60.3 percent were males. The fact that close to 40 percent of the students were females is noteworthy given that in Colorado only about eight percent of newly-licensed riders are female. While the largest group of students were 15-17 year olds (46.4 percent), 37 percent of the enrollees were over 25.

Table 4-2

Rounds 1-4 Enrollment by Age and Sex

<u>Age</u>	<u>MALE</u>		<u>FEMALE</u>		<u>TOTAL</u>	
	<u>Row Percent</u>	<u>Column Percent</u>	<u>Row Percent</u>	<u>Column Percent</u>	<u>n</u>	<u>Column Percent</u>
15-17	73.2	56.4	26.8	31.3	228	46.4
18-25	51.9	14.2	48.1	20.0	81	16.5
26-35	33.3	9.1	66.7	27.6	81	16.5
36-45	52.6	10.1	47.4	13.8	57	11.6
46+	<u>68.2</u>	<u>10.1</u>	<u>31.8</u>	<u>7.2</u>	<u>44</u>	<u>9.0</u>
TOTAL	60.3	100.0	39.7	100.0	491	100.0

Table 4-3 presents the enrollment data by round for high school students and adults.

Table 4-3

Enrollment Data by High School Students/Adults\*  
for Rounds 1-4

<u>Round/Age Category</u>	<u>n</u>	<u>Percent</u>
Round 1		
High School Students	119	76.8
Adults	36	23.2
Round 2		
High School Students	58	45.3
Adults	70	54.7
Round 3		
High School Students	48	44.9
Adults	59	55.1
Round 4		
High School Students	13	12.7
Adults	89	87.3
Round 1-4 Summary		
High School Students	238	48.4
Adults	254	51.6

\* Adults defined as individuals 18 and older.

The data presented in Table 4-3 reveal that across the four rounds there were close to equal numbers of high school students and adults. However, examining the data by round, we notice a steady increase in the proportion of students that were adults.

This shift in student population is no doubt a function of changes in the way the course was promoted. That is, prior to Round 1 there was a very heavy recruitment effort in the Jefferson County High Schools. Two high schools (Wheatridge and Lakewood) received particular emphasis, since eight of the ten MRC instructors taught at these schools. After Round 2, course promotional activities involved greater use of the mass media (e.g., newspaper display advertisements).

It, therefore, can be assumed that these later recruitment efforts reached many adults in the Metropolitan Denver area, and that a number of these adults found a course for novice riders to be of interest.

Table 4-4 provides a breakdown of enrollment data by age category, sex, and pre-course motorcycle licensure status.

Table 4-4

Pre-Course Motorcycle Licensure Status  
by Age Category and Sex

<u>Age/Sex Category</u>	<u>Previously Licensed</u>		<u>Non-Licensed</u>	
	<u>n</u>	<u>Percent</u>	<u>n</u>	<u>Percent</u>
High School Male	15	8.9	153	91.1
High School Female	1	1.6	61	98.4
Adult Male	25	22.3	87	77.7
Adult Female	12	9.7	112	90.3
TOTAL				
Male	40	14.3	240	85.7
Female	<u>13</u>	<u>7.0</u>	<u>173</u>	<u>93.0</u>
	53	11.4	413	88.6

The licensure data indicates that, overall, 11.4 percent of the students had a motorcycle license prior to taking the MRC. Examining the data by age category and sex, we find that adults had a noticeably higher rate of pre-course licensure than did high school students, and that males were more likely to have been licensed than females.

Interest in Course

On the course application form, students were asked to indicate why they were interested in taking the MRC, and how they had heard about the course. Table 4-5 provides a breakdown of the interest data by age category.

Table 4-5

## Student Interest in Course by Age Category\*

"Why are you interested in this course? Check up to two reasons."

<u>Reasons</u>	<u>High School Students**</u>		<u>Adult Students***</u>	
	<u>n</u>	<u>Percent</u>	<u>n</u>	<u>Percent</u>
Friends might take course	12	4.8	4	1.5
Seems like the best way to learn to ride	155	62.0	182	68.2
To convince parents that motorcycle riding is OK	59	23.6	4	1.5
It is the only way I could learn to ride	46	18.4	54	20.2
In order to get a motorcycle license	111	44.4	125	46.8
Because the course sounds like fun	80	32.0	49	18.4

\* Percentages add to over 100, since respondents could check up to two responses.

\*\* Data for high school students based on n=250.

\*\*\* Data for adult students based on n=267.

As indicated in Table 4-5, for both high school students and adults, the leading reason for interest in the MRC was "Seems like the best way to learn to ride." In general, high school students and adults were interested in the course for the same reasons. However, as might be predicted, a number of high school students (23.6 percent) were interested in the MRC as a means to convince their parents that "motorcycle riding is OK." Also, compared to the adults, a larger proportion of the high school students were interested in the course "because it sounded like fun."

Table 4-6 presents data concerning how or where students first learned about the MRC. These data have been grouped by Rounds 1 and 2 versus Rounds 3 and 4. This grouping reflects the fact that following Round 2 new promotional approaches (e.g., newspaper display advertisements) were employed, and less emphasis was placed on recruiting high school students.

Table 4-6

## How/Where Students Learned About the MRC

<u>Source</u>	<u>Rounds 1 and 2*</u>		<u>Rounds 3 and 4**</u>	
	<u>n</u>	<u>Percent</u>	<u>n</u>	<u>Percent</u>
Newspaper	11	3.7	73	33.2
Radio Spot	7	2.4	1	.5
TV News Coverage of Course	30	10.1	4	1.8
Poster	43	14.5	28	12.7
Announcement made in class/school	73	24.6	36	16.4
Through a friend	59	19.9	55	25.0
Other	34	11.4	30	13.6

\* Data for Rounds 1 and 2 based on 297 student enrollees.

\*\* Data for Rounds 3 and 4 based on 220 student enrollees.

During Rounds 1 and 2, word-of-mouth was the most frequently reported way of learning about the course (i.e., "announcement made in class/school" or "through a friend").

During Rounds 3 and 4, display advertisements in Denver newspapers were used to reach a larger audience. This promotional technique was apparently effective, as 33 percent of the students reported that they learned about the course through such an advertisement. Word-of-mouth was also reported by a number of Round 3 and 4 students as the way they heard about the course.

#### Course Completion Data

Table 4-7 provides a summary of course completion data by age category.

Table 4-7

## Course Completion Data

<u>Age Group</u>	<u>Started Course</u>	<u>Completed Course</u>	<u>Completion Rate (Percent)</u>
Adults	254	172	67.7
High School Students	<u>238</u>	<u>165</u>	<u>69.3</u>
TOTAL	492	337	68.5

The overall course completion rate was 68.5 percent. High school students had a slightly higher completion rate compared to adults (69.3 percent versus 67.7 percent, respectively). The course completion rates for Rounds 1, 3, and 4 were very close, while the rate for Round 2 was slightly lower (Round 1--70.3 percent; Round 2--64.8 percent; Round 3--69.1 percent; and Round 4--69.6 percent). The lower rate for Round 2 was likely a function of the cold weather that sometimes occurred during the second half of Round 2 (i.e., during November and early December).

Of the 492 students who started the course, 337 (68.5 percent) successfully passed all course requirements. A total of 155 students (31.5 percent) did not pass the course for one or more of the following reasons:

1. Dropped out because of lack of interest, or other commitments.
2. Failed mid-course range skill test.
3. Failed end-of-course street test.
4. Failed end-of-course knowledge test.

Also, it should be pointed out that some students dropped out of the course because they decided, from hands-on experience, that motorcycling was not for them. From a safety standpoint, this is a desirable effect of the course.

With respect to the students who successfully completed the course, data from the evaluations described later in this section indicate that:

1. All graduates acquired the fundamental knowledge required to begin safely riding on the street.
2. All graduates acquired the basic skills necessary for street riding.
3. Approximately 35 percent of the graduates demonstrated mastery of the more advanced skills that were tested, (e.g., rapid stopping and quick evasive maneuvers).

This last finding pertains to scores obtained in the MOST. Close to two-thirds of the MRC graduates were not able to achieve a passing score on the MOST. Detailed discussion of this finding is presented later in this section, and the educational implications of the MOST results are discussed in Section 5, Recommendations.

### Knowledge Test Results

A knowledge test comprised of items from the Motorcycle Operators Manual (MOM) test file was given to students before (pre-) and after (post-) the MRC. Twenty-five of the 50 items on the pre-test and post-test were identical. Table 4-8 provides a summary for these 25 items.

Table 4-8

#### MOM Pre-/Post-Test Comparison

<u>Score</u>	<u>Pre-Test Percent</u>	<u>Post-Test Percent</u>
23-25	.9	7.6
20-22	19.1	38.0
17-19	40.1	43.2
14-16	28.6	9.7
11-13	9.7	1.5
<11	1.5	0.0
Mean Score	17.02	19.24

Prior to the course, approximately 60 percent of the students obtained a score of 17 or above. Following the course, close to 90 percent of the students scored 17 or above. The improvement in mean score (17.02 to 19.24) is statistically significant ( $\alpha = .001$ ).

The MRC Knowledge Test, which is an integral part of the course, was also administered to all students at the end of the course. The distribution of scores on this test is presented in Table 4-9.

Table 4-9

MRC Knowledge Test Results

<u>Score Category</u>	<u>Percent of Students</u>
48-50	12.3
45-47	34.5
42-44	36.6
39-41	11.2
36-38	4.0
35 or less	1.3

These data indicate that close to 95 percent of the students achieved a passing score (less than 20 percent wrong) on the MRC Knowledge Test.

The results of the knowledge tests suggest that nearly all students acquired the fundamental knowledge required to begin riding on the street. However, these findings should be tempered somewhat. In terms of traditional test theory, both of these tests (particularly the MRC Knowledge Test) could have more ceiling and should contain items with greater discriminating power.

Session Observation Data

Conduct of each MRC session (i.e., hour), and Exercises within sessions, was subjected to close scrutiny during field evaluation activities. Employing special session observation forms, the project staff documented the following variables: Extent to which instructors were properly addressing session/exercise objectives, use of coaching tips, time requirements, student mastery/nonmastery of specified skills, and administrative problems.

These session observation data were used, along with data from the more global evaluation instruments, to specify curriculum revisions which were implemented following Rounds 1 and 2 and again following Rounds 3 and 4.

A sample of the type of data collected during the session observations is provided in Exhibit 4-1.

Range Skill Test Results

The Range Skill Test (RST) provided a mid-course assessment of student performance. Students were required to pass this test (19 penalty points or less) before proceeding with the more demanding range exercises in the

RANGE OBSERVATION RECORD  
Session 17 Exercise 29

Date 10/20/77  
Observer JCP  
Section # 12  
Instructor Patee  
Range Inst. Jenson  
Number of Students  
Present 11  
Absent 1

QUICK STOPS

OBJECTIVE

Students must be able to bring the motorcycle to a stop in the shortest distance.

Time: 20 min.

Time Spent:

DIRECTIONS

1. Assign 6 riders to Point A and 6 riders to Point B.
2. Instruct the students to do the following, one at a time:
  - a. Enter the braking area at 15 mph in second gear and stop in the shortest distance using both brakes.
  - b. Repeat exercise at 20 mph.
3. Stop the exercise and give directions for the next exercise.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

COACHING TIPS

1. Stress the importance of the increased use of the front brake.
2. Warn the students of the danger of front wheel lock and of the need to keep the wheel straight.
3. If riders are doing well, instruct them to make stops on your signal rather than when they pass the cone.
4. Emphasize that an "impending skid" (just short of a lock in the rear wheel) is the optimum braking condition.

Not enough emphasis

Too much emphasis

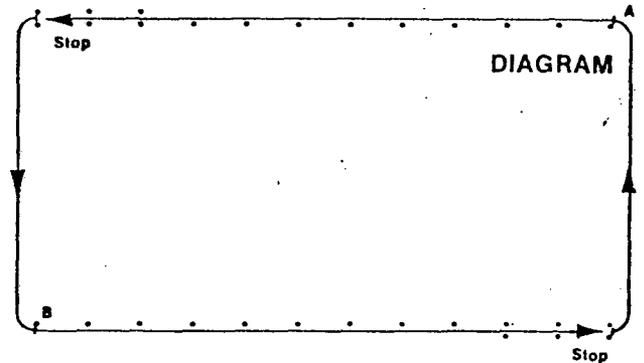
\_\_\_\_\_

\_\_\_\_\_

STUDENT EVALUATION

Rating Scale: 0 - Not Observed, X - Inadequate, ✓ - Adequate

1. Keeps the front wheel pointed straight ahead
2. Does not release the rear brake until completely stopped
4. Attains prescribed speed
5. Keeps head and eyes up
6. Applies front wheel brake (steady pressure - no jerk or grab)
7. Accomplishes braking in the shortest distance with rear wheel "impending skid"



St. #	1. Keeps the front wheel pointed straight ahead	2. Does not release the rear brake until completely stopped	4. Attains prescribed speed	5. Keeps head and eyes up	6. Applies front wheel brake (steady pressure - no jerk or grab)	7. Accomplishes braking in the shortest distance with rear wheel "impending skid"		
1	✓	✓	✓	✓	✓	✓		
3	✓	✓	✓	✓	✓	✓		
5	✓	✓	✓	✓	X	X		still afraid to get on brakes
7	✓	✓	✓	✓	✓	✓		
9	✓	✓	✓	✓	✓	X		Locks rear brake & skids
11	✓	✓	✓		✓	✓		

NOTES:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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\_\_\_\_\_

Exhibit 4-1

Sample Range Observation Data

second half of the course. As indicated in Table 4-10, nearly a third (30.3 percent) of the students who took the RST failed on their first attempt). These students were provided up to two hours of remedial instruction, and then retested. Overall, 95.5 percent of the students eventually passed the RST.

Table 4-10

First Attempt Range Skill Test (RST) Scores

<u>Penalty Points</u>	<u>n</u>	<u>Percent</u>	
0-4	53	13.4	
5-9	80	20.3	
10-14	70	17.7	
15-19	71	18.0	
20-24 (Failing)	42	10.6	} 30.6*
25-29 (Failing)	25	6.3	
30+ (Failing)	54	13.7	
	395		

\* Of the 395 students who took the RST, 121 (30.6 percent) failed on their first attempt. Of the 121 who failed, 103 (85.1 percent) were able to pass the RST on their second attempt.

The RST consists of nine separate exercises. Table 4-11 provides a breakdown of the first attempt scores (points off) by exercise. These data indicate that, of the nine exercises, the following four were the most difficult:

1. Making "U" turns.
2. Making an "S" turn from a stop.
3. Straight line balance.
4. Weaving.

In examining the RST data, it becomes apparent that older students tended to have more difficulty with the test than their younger counterparts (i.e., high school students and young adults). As presented in Table 4-12, students 26 and older obtained much higher scores on the RST.

Table 4-11

## First Attempt RST Scores by Exercise

<u>Exercise</u>	<u>Points Off</u>	<u>Percent of Students</u>
1. Controlling the Engine:		
. Starting	0	93.9
	1	5.1
	3	.8
	5	.3
. Stalling	0	74.3
	1	17.6
	3	6.4
	5	1.8
2. Upshifting/Downshifting/Stopping:		
. Upshifting	0	89.1
	5	9.4
	10	1.5
. Downshifting	0	89.1
	5	10.4
	10	.5
. Stopping	0	68.2
	3	23.2
	5	8.7
3. Operating the Controls	0	56.2
	1	33.3
	5	8.9
	10	1.5
4. Straight Line Balance	0	50.6
	1	16.5
	3	5.9
	5	19.1
	6	4.3
	8	2.0
	10	1.5
5. Making an "S" Turn from a Stop	0	57.4
	5	31.6
	10	11.0
6. Making "U" Turns	0	49.4
	5	36.4
	10	14.2
7. Stopping Quickly	0	93.9
	3	4.3
	5	1.8
	6	---
8. Weaving	0	63.9
	3	19.6
	5	10.7
	6	2.0
	8	2.5
	10	1.3

Table 4-12

RST First Attempt Scores by Age

<u>Age</u>	<u>n</u>	<u>Mean Penalty Points</u>
15-17	157	12.14
18-25	56	12.77
26-35	57	20.30
36-45	44	21.00
46+	34	23.03

A partial explanation for this finding is the fact that the RST requires precision motor skills which may deteriorate with age; also, there was some self-report evidence that older students experienced greater "test anxiety" than their younger counterparts.

MRC Street Test/Motorcyclist-In-Traffic (MIT) Test Results

During Rounds 1 and 2, the MRC Street Test was used to assess end-of-course street riding skills. Practically all (99 percent) of the students who took this test passed.

Following Round 2, the Motorcyclist-In-Traffic (MIT) Test was selected as a replacement for the MRC Street Test. The MIT provides standardized procedures for evaluating a fairly broad sample of street-riding behaviors. During Rounds 3 and 4, 96 percent of the students passed the MIT. (A detailed presentation of MIT results is provided in a subsequent section entitled "street versus no-street training.")

Assuming that both of the above-mentioned street tests are valid measures of street riding abilities, we can conclude that almost all MRC students exhibited sufficient skills to begin riding on the street.

Motorcycle Operator Skill Test (MOST) Results

The Motorcycle Operator Skill Test (MOST) provides assessment of basic performance skills and emergency maneuvers. This test, designed as a licensing examination, was used in the field test of the MRC as an end-of-course performance measure. While it is not clear that graduates of a novice-rider course should demonstrate mastery of all skills tested, the MOST, nonetheless, provided enough ceiling to accurately measure the performance skills of the students involved in the field test.

The MOST has been used extensively as part of the California Improved Motorcyclist Licensing and Test Project [13]. During the California project, two different passing criteria were conducted: (1) passing = 12 or fewer penalty points, or (2) passing = 15 or fewer penalty points. Using

the 12-point criterion, only 22.7 percent of the students who took the MOST in Rounds 1-4 passed. On the other hand, over one-half (55.5 percent) of the students tested received 15 or fewer points.

Table 4-13 provides a breakdown of performance on the MOST by exercise. Since failure rates by exercise have not been firmly established, the "failure" data in this table are based on three or more penalty points for Exercises 1 and 2, and five or more penalty points for the other exercises.

Table 4-13

MOST Failure Rate by Exercise

<u>MOST Exercise</u>	<u>Failure Rate Percent</u>
1. Starting and Moving Up a Hill	13.3
2. Sharp Turn	7.7
3. Accelerating in a Turn	20.1
4. Slowing in a Turn	4.7
5. Normal Stop	11.5
6. Turning Speed Selection	26.8
7. Quick Stop-Straight	41.0
8. Obstacle Turn	68.4
9. Quick Stop-Curve	74.3

The data presented in Table 4-13 reveal that students had the greatest difficulty with Exercises 7, 8, and 9. Major curriculum revisions to improve emergency stopping skills, first implemented following Round 1 and further revised following Round 2, did have a noticeable effect on Exercise 7--Quick Stop-Straight. Specifically, the failure rate for this exercise by round was: Round 1--64.7 percent, Round 2--55.4 percent, and Rounds 3 and 4--29.5 percent. On the other hand, the course revisions designed to address Exercises 8 (Obstacle Turn) and 9 (Quick Stop-Curve) were relatively modest and had little effect in improving these skills during later rounds of the course. As discussed in the Recommendations Section of this report, curriculum design for these last two skills requires additional, and more extensive, investigation.

The data presented in Table 4-14 reveal that the age differences identified in the RST results are also reflected in the MOST--younger students received fewer penalty points than older students.

Table 4-14

MOST - Mean Score by Age

<u>Age</u>	<u>n</u>	<u>Penalty Points</u>
15-17	138	16.32
18-25	51	17.94
26-35	53	19.13
36-45	34	20.00
46+	24	22.38

In addition to age, prior riding experience was found to be a factor that appeared to influence MOST scores. Across all students, the mean score on the MOST was 17.99. For students who had a motorcycle license prior to the course, the mean was four points lower ( $\bar{X}=13.91$ ). Alternatively, the mean for students without a motorcycle license was almost five points higher ( $\bar{X}=18.50$ ).

These data suggest that, for some students, the structured training provided in the MRC may not provide enough riding experience to permit them to successfully negotiate all of the MOST exercises. In other words, in order to pass the MOST, some students may require structured training plus additional riding time that serves to make them more confident in their riding ability.

User Acceptance

Data concerning user acceptance of the MRC have been grouped in terms of the following categories:

1. Student Evaluations by Course Session.
2. Overall Student Evaluations.
3. Parent Questionnaire Data.
4. Instructor and Administrator Evaluations.

The evaluation results for each of these categories are presented in the subsections that follow.

Student Evaluations by Course Session

Students were asked to complete a detailed evaluation of the MRC at two points during the course. The first evaluation occurred during Session

10 and covered Sessions 1 through 10. The second evaluation occurred after the last course session and covered Sessions 11 through 23. This last evaluation also included an overall evaluation of the course.

Copies of the evaluation instruments used for the purposes described above are provided in Appendix A.

Classroom Sessions. The first four Classroom Sessions (1, 2, 4, 10) of the MRC were rated by students during the Session 1-10 evaluation. Likewise, during the last evaluation, students rated Classroom Sessions 11, 12, 16, and 20. During each of these evaluations, students were asked to sequentially rank the sessions by assigning a "1" to the most valuable session and a "4" to the least valuable.

The results of these rankings are presented in Tables 4-15 and 4-16.

Table 4-15

Student Evaluation of MRC  
Classroom Sessions 1, 2, 4, and 10

<u>Session No.</u>	<u>Content</u>	<u>Mean Rating*</u>
1	Introduction to motorcycling/motorcycle controls	3.26
2	Protective clothing, mounting/dismounting, posture, starting, stopping, safety rules	2.56
4	Turning/upshifting/downshifting, braking	2.25
10	Being seen, communicating, following distance, riding situations	1.87

\* Based on scale of 1-4, with "1" most valuable and "4" least valuable.

Table 4-16

Student Evaluation of MRC  
Classroom Sessions 11, 12, 16, and 20

<u>Session No.</u>	<u>Content</u>	<u>Mean Rating</u>
11	Application of IPDE to traffic situations	2.27
12	Riding situations, passing, group riding, night riding, parking	2.28
16	Advanced braking, different surfaces, standing on pegs, emergency situations, carrying passengers	1.73
20	Selection, insurance, inspection, trouble-shooting	3.69

\* Based on scale of 1-4, with "1" most valuable and "4" least valuable.

Interpretation of the above results is relatively straightforward: the lowest rated sessions have little to do with motorcycle safety per se, while the highest rated sessions cover important skills and knowledge necessary for safe riding.

Most of Session 1 involves introductory material designed to interest students in motorcycling; likewise, half of Session 20 is concerned with how to buy a motorcycle and motorcycle insurance. On the other hand, Sessions 10 and 16 present information that students judged to be of value in making them safer riders. It should further be noted that much of the content in Sessions 1 and 20 covers information that most persons interested in motorcycling already knew (e.g., location of controls, types of motorcycles). Alternatively, even students with considerable pre-course riding experience, reported that they were unaware of some of the safety critical content covered in Sessions 10 and 16 (e.g., conspicuity, counter-steering).

Range Sessions. Student ratings (3, 5, 6, 7, and 8) are summarized in Table 4-17.

Table 4-17

Student Evaluation of MRC Range  
Sessions 3, 5, 6, 7, and 8

<u>Session No.</u>	<u>Content</u>	<u>Mean Rating*</u>
3	Mounting/dismounting, starting/stopping, walking the cycle, friction point, straight line ride	3.79
5	Circles, weaving, figure eights	3.62
6	Sharp turns, straight line shifting, turning at higher speeds	2.45
7	Riding slowly, braking, turning and adjusting speed	3.01
8	Tight circles, weaving, shifting and accelerating in a turn, braking	1.95

\*Based on a scale of 1-5, with "1" most valuable and "5" least valuable.

Session 3 was the first on-cycle session and, for many students, the exercises in this session are not perceived as challenging or interesting. Session 8, on the other hand, involves a variety of challenging riding tasks. In summary, students rated the easiest of the first five range sessions as the "least valuable" and rated the last, and most challenging, of the first five range sessions as the "most valuable." Student ratings of the last four Range Sessions (13, 17, 18 and 21) are summarized in Table 4-18.

Table 4-18

Student Evaluation of MRC Range  
Sessions 13, 17, 18, and 21

<u>Session No.</u>	<u>Content</u>	<u>Mean Rating*</u>
13	Simulated traffic situations, passing, other vehicles	2.60
17	Rear wheel skids, quick stops, stopping on a curve	1.74
18	Riding on pegs, obstacles, quick lane change, carrying passengers	2.12
21	Pre-ride inspection maintenance	3.44

\* Based on a scale of 1-4, with "1" most valuable and "4" least valuable.

Review of Table 4-18 reveals that students rated these latter range sessions in the same fashion as the first five range sessions: the most challenging exercises (Session 17) received the highest rating, and the session covering pre-ride inspection and maintenance received the lowest rating. Sessions 13 and 18, which are of only modest challenge, received intermediate ratings.

Street Sessions. During Rounds 1 and 2, all students received three street sessions (14, 15, and 19). Following Round 2, it was determined that only 50 percent of the students in Rounds 3 and 4 would receive on-street training. This was done to permit experimental evaluation of the benefits provided by this type of training (the results of this evaluation are presented in a subsequent section).

The students who did receive the street sessions were asked to rank them from 1 to 3 with "1" being "most valuable" and "3" "least valuable." The results of these rankings are presented in Table 4-19.

Table 4-19

Student Evaluation of MRC Range  
Sessions 3, 5, 6, 7, and 8

<u>Session No.</u>	<u>Content</u>	<u>Mean Rating*</u>
14	Basic street riding	2.26
15	Intermediate street riding	1.96
19	Advanced street riding	1.69

\* Based on a scale of 1-3, with "1" most valuable and "3" least valuable.

Again, we find that students rated the most challenging session (advanced street riding) the highest, and the least challenging (basic street riding) the lowest. However, since the numerical difference between the three rankings is not that great, we can assume that most students found all three street sessions to be of value.

### Overall Student Evaluations

During the last session of the MRC, students completed an evaluation form that addressed the course as a whole. The results of these evaluations are described below.

Course Components. The components of the MRC were divided into six categories, and students were asked to sequentially rank these components by assigning a "1" to the most valuable component and a "6" to the least valuable. The results of these rankings are presented in Table 4-20.

Table 4-20

#### Student Evaluation of MRC Course Components

<u>Course Component</u>	<u>Mean Rating</u>
Riding on Range	1.68
Riding on Street	2.23*
Films/Filmstrips	3.69
Classroom Lectures	3.93
Tests/Evaluations	4.47
Textbook	4.85

\* Does not include 50 percent of the Round 3 and 4 students who did not ride on the street.

As might be expected, these data indicate that students find their on-cycle experience to be the most valuable aspect of the course. Classroom activities (e.g., films and lectures) received an intermediate rating. The course tests/evaluations and the textbook were the lowest rated.

During the FTMRC, students were subjected to a number of testing and evaluation activities that are not part of the normal MRC (e.g., MOST, completion of course evaluation forms). It is, therefore, not surprising that students did not rate these activities very highly. The tests/evaluations were probably rated higher than the textbook because some of the tests involved riding (e.g., Range Skill Test, MOST). Nonetheless, it is somewhat unusual to find the textbook to be the lowest rated course component.

Overall Course Evaluation. As part of the final evaluation, students also answered questions about various aspects of their course experience.

These questions, and a summary of the response distribution, are presented in Exhibit 4-2. The data presented in this table indicate that student acceptance of the course was, for the most part, very favorable. For example, over 80 percent (46.6 percent + 34.1 percent) of the students said that they learned more from the MRC than they had expected to learn; 89.6 percent (43.1 percent + 46.5 percent) enjoyed the course; and 98.5 percent would recommend the course to a friend.

The questions on the MOST indicate that over 40 percent (7.8 percent + 33.0 percent) of the students found this performance test to be difficult. Likewise, 36.6 percent (1.4 percent + 6.8 percent + 28.4 percent) of the students did not feel that the MRC totally prepared them for the MOST.

In summary, the results of the overall course evaluations were, with the exception of MOST-related preparation, very positive.

#### Parent Questionnaire Data

During Rounds 1 and 2, the overwhelming majority of the course enrollees were high school students. Accordingly, following each of these rounds, the parents of each student were mailed a questionnaire that addressed parental feelings toward the MRC. This survey was conducted by the Jefferson County Public Schools.

Questionnaires were returned by a total of 92 parents. This represented a response rate of 32 percent.

The results of this survey are summarized in Exhibit 4-3.

As illustrated in this table, parental response to the MRC was very favorable. Before their son/daughter took the MRC, only 29 percent of the parents surveyed were "very comfortable" with permitting their child to enroll in the course. Following the course, 53 percent of the parents surveyed were "very comfortable" with this decision. Also, 70 percent of the parents surveyed indicated that it was "extremely appropriate" to offer motorcycle rider education through the public schools.

#### Instructor and Administrator Evaluations

The MRC instructors and the Jefferson County School administrators who were involved in the project were not asked to complete formal evaluation instruments. This was not necessary, since ASA had regular contact with these individuals, and we were, therefore, able to solicit their input/feedback on an ongoing basis.

The instructors for the FTMRC were all regular Jefferson County High School teachers, and the majority were avid motorcyclists, with substantial street-riding experience. Eight of the ten original FTMRC instructors are still teaching the course, and find it to be a very rewarding experience. In fact, certain instructors enjoy teaching the MRC more than their regular classroom subjects. The two instructors who dropped out of the program both had somewhat limited riding experience and, eventually, lost

Exhibit 4-2

Overall Course Evaluation

How much did you learn from the MRC?

<u>0.9%</u> Significantly Less Than I Expected	<u>1.9%</u> Less Than I Expected	<u>16.6%</u> About What I Expected	<u>46.6%</u> More Than I Expected	<u>34.1%</u> Significantly More Than I Expected
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How much did you expect to learn from the MRC?

<u>0.6%</u> Very Little	<u>3.7%</u> Little	<u>32.8%</u> Wasn't Sure	<u>36.5%</u> A Moderate Amount	<u>16.4%</u> A Great Amount
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How challenging did you find the course to be?

<u>3.1%</u> No Challenge	<u>12.6%</u> Some Challenge	<u>23.9%</u> Average Challenge	<u>46.0%</u> Challenging	<u>14.4%</u> Extremely Challenging
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How enjoyable or fun was the MRC for you?

<u>0.3%</u> Extremely Boring	<u>0.6%</u> Boring	<u>9.5%</u> It Was O.K.	<u>43.1%</u> Enjoyable	<u>46.5%</u> Extremely Enjoyable
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How would you rate your head instructor (classroom and range) for his overall performance in teaching the course?

<u>0.0%</u> Very Poor Performance	<u>0.6%</u> Poor Performance	<u>6.4%</u> Average Performance	<u>30.4%</u> Good Performance	<u>62.6%</u> Excellent Performance
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How would you rate your range instructor for his overall performance in teaching the course?

<u>0.3%</u> Very Poor Performance	<u>1.2%</u> Poor Performance	<u>5.5%</u> Average Performance	<u>32.8%</u> Good Performance	<u>60.1%</u> Excellent Performance
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I think that the time span over which the course was taught was:

<u>23.5%</u> Too Short	<u>14.2%</u> Too Long	<u>62.3%</u> Just Right
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Exhibit 4-2 (Continued)

One of the evaluation sessions in the MRC required you to take the Motorcycle Operator Skill Test (MOST). How difficult for you were the exercises in MOST?

<u>7.8%</u>	<u>33.0%</u>	<u>36.0%</u>	<u>18.7%</u>	<u>4.4%</u>
Extremely Difficult	Moderately Difficult	Neither Difficult Nor Easy	Moderately Easy	Extremely Easy

To what extent do you feel the range exercises in the MRC prepared you for the exercises in the MOST (e.g., starting and moving up a hill, sharp turns, turning speed selection, etc.)?

<u>1.4%</u>	<u>6.8%</u>	<u>28.4%</u>	<u>42.5%</u>	<u>20.9%</u>
Not At All	Very Little	To Some Extent	To A Great Extent	To a Very Great Extent

Would you recommend the MRC to a friend?

<u>98.5%</u> Yes	<u>1.5%</u> No
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Exhibit 4-3

Summary of Parent Questionnaire Data

Do you approve of the regular use of a motorcycle by immediate family members?

48% Yes      30% No      22% Maybe

Please indicate the degree of comfort with which you initially permitted your son/daughter to take the rider course (i.e., how you felt before the course).

<u>29%</u> Very Comfortable	<u>35%</u> Somewhat Comfortable	<u>0%</u> No Opinion	<u>24%</u> Somewhat Uncomfortable	<u>12%</u> Very Uncomfortable
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How comfortable would you be making the same decision today?

<u>53%</u> Very Comfortable	<u>29%</u> Somewhat Comfortable	<u>0%</u> No Opinion	<u>18%</u> Somewhat Uncomfortable	<u>0%</u> Very Uncomfortable
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How much change in your son's/daughter's attitudes about safe riding has occurred as a function of the rider course?

<u>0%</u> Worse Attitude	<u>11%</u> No Change in Attitude	<u>21%</u> Can't Tell	<u>43%</u> Noticeably Improved Attitude	<u>25%</u> Greatly Improved Attitude
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Do you feel that your son's/daughter's motorcycle riding skills:

<u>0%</u> Have not Changed	<u>1%</u> Have Improved Slightly	<u>25%</u> I don't know	<u>23%</u> Have Improved Moderately	<u>51%</u> Have Improved Greatly
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Do you feel that your son's/daughter's knowledge about safe motorcycling:

<u>0%</u> Has not Changed	<u>3%</u> Has Improved Slightly	<u>1%</u> I don't know	<u>27%</u> Has Improved Moderately	<u>69%</u> Has Improved Greatly
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Exhibit 4-3 (continued)

Please indicate your reactions to the following statement: I feel the Motorcycle Rider Course provided an important educational experience for my son/daughter.

<u>2%</u>	<u>3%</u>	<u>3%</u>	<u>10%</u>	<u>84%</u>
Strongly	Somewhat	Don't	Somewhat	Very
Disagree	Dissatisfied	Know	Satisfied	Satisfied

How satisfied was your son/daughter with the Motorcycle Rider Course?

<u>0%</u>	<u>3%</u>	<u>3%</u>	<u>10%</u>	<u>84%</u>
Very	Somewhat	Don't	Somewhat	Very
Dissatisfied	Dissatisfied	Know	Satisfied	Satisfied

How satisfied are you with the overall course?

<u>0%</u>	<u>0%</u>	<u>4%</u>	<u>42%</u>	<u>54%</u>
Very	Somewhat	No	Satisfied	Very
Dissatisfied	Dissatisfied	Opinion		Satisfied

How appropriate do you feel it is for a motorcycle rider course to be offered by the Jefferson County School District?

<u>70%</u>	<u>25%</u>	<u>1%</u>	<u>3%</u>	<u>1%</u>
Extremely	Somewhat	No	Somewhat	Definitely
Appropriate	Appropriate	Opinion	Inappropriate	Inappropriate

Would you recommend the course for someone else?

<u>97%</u> Yes	<u>3%</u> No
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enthusiasm for teaching the course. In this respect, it is our judgment that, in addition to good teaching skills, considerable street riding experience is a prerequisite for becoming an effective MRC instructor.

Jefferson County school administrators were supportive of the field test objectives from the beginning, and praised the way the program operated during the period of Fall 1977 through Fall 1980.

Federal funding of the FTMRC ended in the Fall of 1980, as did ASA involvement in operation of the training program. Nonetheless, with school system support and modest financial assistance from MSF, large-scale offering of the MRC continued during 1981. Through student fees the program has become largely self-sufficient.

Throughout the FTMRC, school administrators said positive things about the program; the fact that they have chosen to continue with the program on their own indicates that they have truly "accepted" this type of rider education program. Likewise, the fact that the majority of the original instructors are still teaching the course is a "bottom line" indication of teacher approval of the program.

#### Administrative Feasibility

The results of all evaluations indicate that, with proper planning and school system support, the MRC is feasible in terms of schedule, curriculum, facility requirements and costs. The large-scale offering of the MRC described herein was accomplished with relatively few administrative problems.

The administrative guidelines presented in the second edition of the MRC Instructor's Guide provide the majority of the information needed to design an effective MRC program.

During the course of the FTMRC, project staff completed two analyses of selected administrative issues (e.g., program costs, recruitment procedures, student attrition). Results of these analyses were documented in the form of project memos, entitled:

1. Input to Plan for Motorcycle Demonstration Project.
2. Cost Estimates for Training Aspect of Motorcycle Demonstration Project.

Copies of these documents are included as Appendix B. Readers wishing additional information concerning administrative requirements should first refer to the administrative guidelines presented in the current MRC Instructor's Guide. The documents referenced above provide additional information that should be of interest to course planners and administrators.

Lastly, recommendations concerning certain administrative issues are provided in Section 5, Recommendations, of this report.

### Street versus No-street Training

As described in the Field Test Conduct Section, the value of on-street training was questioned at meetings that occurred following Round 2. This question centered on whether the cost and risk of on-street training was justified in terms of increased knowledge and skill acquisition.

To address this question, range sessions were developed that could be used as substitutes for the three on-street sessions. "Street" and "no-street" versions of the course were thus specified.

These two different course configurations were experimentally evaluated during the conduct of Rounds 3 and 4. The remainder of this subsection describes the results of these evaluations.

#### Pre-Treatment Data

For this particular evaluation, the "treatment" under study was on-street training or simulated street training on the driving range.

To compare these two training conditions, students recruited for Rounds 3 and 4 were randomly assigned to either the "street" version of the course or to the "no-street" configuration.

A total of 102 students actually reported for the start of the course sections that would include on-street training. Likewise, a total of 115 students were in attendance for the first sessions of the "no-street" courses. The difference in number of subjects in each group was a function of attrition that occurred after students had applied for the course. This differential rate of attrition is not a function of treatment assignment, since students were initially unaware of the type of course to which they had been assigned.

In this subsection, pre-treatment data are examined to determine the homogeneity of the two treatment groups prior to treatment (i.e., prior to on-street training or simulated street training on the range).

Table 4-21 presents data concerning the pre-course riding experience of the two groups.

Table 4-21

Pre-Course Motorcycle Operation

Operated Motorcycle Prior to MRC	TREATMENT GROUP			
	Street		No-Street	
	n	Percent	n	Percent
Yes	61	59.8	73	63.5
No	41	40.2	42	36.5

The data provided in Table 4-21 indicates that there was not a significant difference in pre-course riding experience for the two groups ( $\chi^2 = .5598, \alpha = .05$ ).

As previously described, all students in the FTMRC were administered a knowledge pre-test on the first day of class. Table 4-22 provides a breakdown of these test scores for the two treatment groups.

Table 4-22

Knowledge Pre-Test Scores

Test A	TREATMENT GROUP	
	Street	No-Street
$\bar{X}$	16.82	17.27
s.d.	2.63	2.29
Test B		
$\bar{X}$	16.78	17.57
s.d.	3.08	2.85

The pre-tests noted above each consisted of 25 test questions from the Motorcycle Operator's Manual (MOM). While the "no-street" group achieved slightly higher scores on both parts A and B of this test, these differences are not significant ( $t = 1.12$  for Part A,  $t = .634$  for Part B).

The last pre-treatment measure which was examined were scores on the Range Skill Test. This test occurs during the first half of the course and both groups were, therefore, administered this test prior to receiving the different street versus no-street treatments. The data are shown in Table 4-23.

Table 4-23

Range Skill Test Scores  
(First Attempt)

	TREATMENT GROUP	
	<u>Street</u>	<u>No-Street</u>
$\bar{X}$	17.56	15.96
s.d.	13.21	10.47

These data indicate that the "street" group scored somewhat higher on the Range Skill Test; however, this difference is not significant ( $t = .908$ ).

The data reviewed in Tables 4-21 through 4-23 indicate that the two groups were homogeneous with respect to the three pre-treatment measures which were examined. In other words, we found no significant difference between the "street" and "no-street" groups in terms of riding-related skill or knowledge.

Post-Treatment Data

This subsection presents data for the post-treatment measures that were used to compare the skill and knowledge acquisition of the two treatment groups. All of the measures described below were collected after the groups had received their particular treatment (i.e., on-street training versus simulated street training on the driving range).

Table 4-24 provides data concerning the number of students within each group that successfully completed all course requirements.

Table 4-24

Course Completion Rate

	TREATMENT GROUP	
	<u>Street</u>	<u>No-Street</u>
Original n	102	115
Passed Course		
n	65	72
Percent	63.7%	62.6%

The slight difference in course completion rate is not significant ( $t = .244$ ).

The next post-treatment measure to be examined was scores on the Motorcyclist In-Traffic Test (MIT). If on-street training was to have a noticeable impact, scores on the MIT should certainly reflect this. As illustrated in Tables 4-25 and 4-26, this was not the case.

Table 4-25

## MIT Frequency Distribution

	MIT Score	n	TREATMENT GROUP	
			Street Percent	No-Street n      Percent
Failing	< 79	3	4.1	4      4.7
Passing	80-85	8	11.0	10     11.6
	86-90	12	16.4	13     15.1
	91-95	24	32.9	28     32.6
	95-100	26	35.6	31     36.0

Table 4-26

## MIT Scores

	TREATMENT GROUP	
	Street	No-Street
n	73	86
$\bar{x}$	90.05	90.62
s.d.	16.097	15.094

As indicated in Table 4-25, failure rate on the MIT was comparable for both groups (41.1 percent for the street group and 4.7 percent for the no-street group).

Examining the mean scores (Table 4-26), we find that the no-street group actually scored slightly higher than the street group. This difference is, however, not significant ( $t = .908$ ).

Insofar as the MIT is a valid measure of street-riding skills, the above data suggest that the no-street group did not suffer from their lack of actual on-street training.

Tables 4-27 and 4-28 provide a breakdown of scores on the MOST for the two groups.

Table 4-27

MOST Frequency Distribution

<u>Penalty Points</u>	<u>TREATMENT GROUP</u>			
	<u>n</u>	<u>Street</u>	<u>n</u>	<u>No-Street</u>
		<u>Percent</u>		<u>Percent</u>
1-10	8	11.6	14	16.5
11-15	26	37.7	16	18.8
16-20	14	20.3	21	24.7
21-25	14	20.3	15	17.6
26+	7	10.1	19	22.4

Table 4-28

MOST Scores

	<u>TREATMENT GROUP</u>	
	<u>Street</u>	<u>No-Street</u>
n	69	86
$\bar{X}$	17.203	18.459
s.d.	6.300	8.104

These data indicate that the street group scored slightly better on the MOST; however, the differences between the two groups are not significant.

Table 4-29 presents a comparison of the MOM knowledge post-test scores for the two treatment groups.

Table 4-29

MOM Knowledge Post-Test Scores

	<u>TREATMENT GROUP</u>	
	<u>Street</u>	<u>No-Street</u>
<u>Part A</u>		
$\bar{X}$	20.082	19.329
s.d.	2.060	2.090
<u>Part B</u>		
$\bar{X}$	19.514	19.600
s.d.	2.130	2.060

The MOM knowledge post-test consisted of two parts: Part B was identical to pre-test Part B; Part A consisted of unique items which were

not included in the pre-test. The difference between the two groups on Part B is not significant ( $t = .257$ ). However, on Part A, scores for the street group were significantly higher ( $t = 2.28$ ).

This last result suggests that the on-street experience permitted the street group students to correctly answer a few more questions on this post-test. Although this difference is significant, the street group, on the average, scored less than two points higher on Part A of the post-test.

Table 4-30 provides a summary of the data for scores on the end-of-course MRC knowledge test.

Table 4-30

MRC Knowledge Test Scores

	TREATMENT GROUP	
	<u>Street</u>	<u>No-Street</u>
$\bar{X}$	44.257	43.904
s.d.	3.088	3.059

While the street group scored slightly higher on this test, the difference between the two groups is not significant ( $t = .718$ ).

The results described above indicate that, for the most part, on-street training did not produce significant increases in riding-related skills or knowledge. Therefore, given the costs and risks associated with on-street training, it is our conclusion that sessions should be an option rather than required component of the MRC. This option is provided for in the Second Edition of the MRC Instructor's Guide.

Other Findings

As work proceeded on the conduct of Rounds 3 and 4, additional research questions surfaced. These questions were judged to be important enough to warrant conduct of two more rounds of course offerings. Accordingly, Rounds 5 and 6 of the FTMRC were designed and conducted to examine the following:

1. The effect of offering a shorter version of the MRC to students who could demonstrate history of basic riding skills.
2. The impact of requiring students to pay a course fee.
3. The extent to which newly licensed riders would voluntarily sign-up for and take the MRC.

The results of these evaluations are presented in the subsections that follow.

Evaluate Twelve-Hour Version  
of the MRC

During Round 5, students with prior riding experience were asked to take a pre-course performance test. This test consisted of the first five exercises of the MOST, and a "passing" score on the test was defined as less than 10 penalty points across the five exercises. Students who passed this test were assigned to a 12-hour version of the MRC that started with Session 9 (the Range Skill Test). Students who failed the pre-test were assigned to the regular 20-hour MRC. Table 4-31 shows the data for the pre-course performance test.

Table 4-31

Round 5 Enrollment and  
Pre-Test Data

<u>Total Enrolled</u>	<u>Passed Pre-Test</u>		<u>Failed Pre-Test</u>		<u>Did Not Qualify for Pre-Test</u>	
	<u>n</u>	<u>Percent</u>	<u>n</u>	<u>Percent</u>	<u>n</u>	<u>Percent</u>
83	18	21.7	25	30.1	40	48.2

Of the 83 students who enrolled for Round 5, 43 (51.8 percent) had prior riding experience and, therefore, qualified to take the MOST pre-test. Of these 43 students, 18 passed the pre-test (21.7 percent of the total enrolled).

Course completion data for the subgroups involved in Round 5 are presented in Table 4-32.

Table 4-32

Round 5 Course Completion Data

	<u>Total</u>	<u>Pre-Tested</u>		<u>No Pre-Test</u>
		<u>Pass</u>	<u>Fail</u>	
Enrolled	83	18	25	40
Completed Course	73	16	23	34
Percent of Respective Total	87.9%	88.8%	92.0%	85.0%

These data indicate that 88 percent of the students enrolled in Round 5 successfully completed all course requirements, and that the completion rate did not vary substantially for the different subpopulations (e.g., pre-tested versus not pre-tested).

It should also be noted that the overall completion rate of 88 percent for Round 5 is substantially higher than the Rounds 1-4 completion rate of 68.5 percent. As discussed in the next subsection, we believe this higher completion rate is related to the fact that Round 5 students paid a course fee (\$45 for the full course, \$25 for the 12-hour course).

Table 4-33 provides a breakdown of the end-of-course MOST scores for the two major subgroups in Round 5.

Table 4-33

Round 5 MOST Scores

MOST Score Category	Total		12-Hour Course Students		20-Hour Course Students	
	Percent	Cumulative Percent	Percent	Cumulative Percent	Percent	Cumulative Percent
0-4	8.5	8.5	25.0	25.0	3.6	3.6
5-9	12.7	21.2	31.3	56.3	7.3	10.9
10-14	22.5	43.7	6.2	62.5	27.3	38.2
15-19	19.7	63.4	25.0	87.5	18.2	56.4
20-24	16.9	80.3	6.2	93.7	20.0	76.4
25-29	12.7	93.0	6.2	99.9	14.5	90.9
30+	7.0	100.0	--	99.9	9.1	100.0
$\bar{X}$		17.08		11.13		18.82

The data presented in Table 4-33 indicates that the students who took the 12-hour MRC scored noticeably better on the MOST than did students who received the full 20-hour course. The mean MOST score for students in the 12-hour course was 11.13 (penalty points), while the mean for the 20-hour course was 18.82. These mean scores can be compared to an overall mean MOST score of 18.50 penalty points for Rounds 1-4.

In reviewing these results, it should be recognized that students in the 12-hour course probably scored better on the MOST because of their pre-course riding experience.

Evaluation of the extent to which students with prior riding experience can effectively "test-out" of the first eight hours of the MRC has revealed the following:

1. A substantial proportion of students with prior riding experience can effectively be exempted from the first eight hours of the 20-hour MRC.
2. Students who are exempted from the first eight hours (i.e., take 12-hour course) perform very well on the end-of-course MOST. That is, there is no indication

that their skill development was impaired by not taking the first part of the course.

It should also be noted that effective pre-testing does not require use of the MOST. During offerings of the MRC not associated with the FTMRC, ASA staff have used the MRC Range Skill Test as a pre-course screening device. We have found the Range Skill Test to be an effective pre-test and recommend its use as such when a MOST facility is not available.

In summary, the procedure of pre-testing selected students served to permit optimal course assignments and made for more cost-effective use of instructional resources.

### Course Fee

For Round 5, a course fee of \$45 was initiated. Using the same recruiting procedures employed in earlier rounds (with the exception of not making announcements in high school classes in this round), there was a comparable response rate between Round 5 and previous rounds--all available sections were filled in approximately in the same amount of time. The \$45 fee thus had little, if any, effect on student interest in the course.

On an end-of-course student questionnaire, Round 5 graduates indicated strong approval for the concept of charging a course fee. In fact, many students indicated they would be willing to pay \$55 or \$65 to take the MRC.

As illustrated in Table 4-34, students who paid a course fee had an overall completion rate of 84.3 percent, which is considerably higher than the rate for the non-paying groups.

Table 4-34

#### Course Enrollment and Completion Data by Group Status

	<u>Started Course</u>	<u>Completed Course</u>	<u>Completion Rate (Percent)</u>
Non-Paying (Rounds 1-4)	492	337	68.5
Paying (Round 5)	83	73	88.0
Non-Paying (Round 6)	<u>48</u>	<u>36</u>	<u>75.0</u>
TOTAL	623	446	71.6

Clearly, students who pay to take the MRC are more likely to successfully complete the course--they apparently want to get their "money's worth." The greater degree of interest in the course by paying students is

also confirmed by the fact that students who paid to take the course had a much better attendance record than non-paying students. Paying students would nearly always contact course administrators to reschedule missed sessions, both range and classroom. Non-paying students would sometimes attempt to reschedule missed range work, but rarely attempted to make up missed classroom sessions.

During subsequent offerings of the MRC that were not part of the FTMRC, the course fee was raised to \$65. This higher fee did not diminish interest in the course, and this source of revenue has enabled the MRC to continue to be offered in Jefferson County.

Compared to most classroom-based, adult education courses the MRC is a very expensive program to operate. Per student costs can range from \$80 to over \$110, depending upon varying cost factors. Based on the findings reported in this subsection, we recommend that course administrators consider charging a course fee. It is our judgment that, in terms of 1982 dollars, a course fee of \$75 to \$95 is entirely reasonable.

#### Recruitment of Newly-Licensed Riders

Round 6 of the FTMRC was conducted to determine the extent to which newly-licensed riders would voluntarily enroll in the MRC. Assuming that the MRC is an accident countermeasure, the extent to which people would take the course on a voluntary basis is an important research question.

Newly-licensed motorcycle riders were identified from lists provided by the Colorado Department of Motor Vehicles (CDMV). Specifically, the names of 805 individuals who had received their motorcycle endorsement in August of 1979 were obtained from CDMV. Early in September of 1979, each of these individuals was mailed an attractive information packet that described the Jefferson County MRC program. To determine maximum enrollment potential, the MRC was offered on a no fee basis to these newly-licensed individuals.

Table 4-35 provides an age/sex profile of the 805 individuals who received this mailing. Table 4-36 is the age/sex profile for the 51 students who completed and returned a course application. Examination of these two tables reveals the following:

1. A vast majority (91.8 percent) of the people who were newly-licensed during August 1979 in the Denver Metropolitan Area were male. A comparable proportion (92.2 percent) of the CDMV students who enrolled in the course were male.
2. Of the males, 67.4 percent of the CDMV candidate students were under 30 years of age. However, only 29.8 percent of the male students enrolled in the course were under 30 years of age. Clearly, the number of male students under the age of 30 who enrolled in the course are underrepresented.

Table 4-35

## Age/Sex Profile of CDMV Student Candidates

Age Category	MALE		FEMALE		TOTAL	
	n	Column Percent	n	Column Percent	n	Column Percent
16-19	145	19.6	13	19.7	158	19.6
20-24	193	26.1	17	25.8	210	26.1
25-29	160	21.7	14	21.2	174	21.6
30-34	104	14.1	12	18.2	116	14.4
35-39	53	7.2	3	4.5	56	7.0
40-44	31	4.2	3	4.5	34	4.2
45-49	20	2.7	3	4.5	23	2.9
50-54	13	1.8	1	1.5	14	1.7
55+	20	2.7	0	--	20	2.5
TOTAL	739		66		805	
Row Percent	91.8%		8.2%		100.0%	

Table 4-36

## Age/Sex Profile of CDMV Student Enrollees

Age Category	MALE		FEMALE		TOTAL	
	n	Column Percent	n	Column Percent	n	Column Percent
16-19	7	14.9	1	25.0	8	15.7
20-24	4	8.5	1	25.0	5	9.8
25-29	3	6.4	1	25.0	4	7.8
30-34	10	21.3	1	25.0	11	21.6
35-39	8	17.0	--	--	8	15.7
40-44	5	10.6	--	--	5	9.8
45-49	4	8.5	--	--	4	7.8
50-54	2	4.3	--	--	2	3.9
55+	4	8.5	--	--	4	7.8
TOTAL	47		4		51	
Row Percent	92.2%		7.8%		100.0%	

Of the 51 students who enrolled in the course, 39 actually attended the first course session. This means that, out of the 805 newly-licensed riders, only 4.8 percent (39/805) actually reported to take the course.

The pre-test that was employed during Round 5 was also administered to all CDMV students at the start of Round 6. Surprisingly, over one-third (37.8 percent) of the newly-licensed riders failed this pre-test.

The course completion rate for the Round 6 students was 73.1 percent, which is similar to the overall completion rate for Rounds 1-4 of 68.5 percent.

Table 4-37 provides a breakdown of the end-of-course MOST scores for Round 6 students.

Table 4-37

Round 6 MOST Scores

<u>Penalty Points</u>	<u>20-Hour Course</u>	<u>12-Hour Course</u>
0-4	4.4%	35.0%
5-9	8.7%	25.0%
10-14	21.7%	30.0%
15-19	30.4%	10.0%
20-24	13.0	--
25-29	13.0	--
20 or more	8.7	--

These data indicate that, overall, the Round 6 students scored better on the MOST than did students in Rounds 1-4. As was the case in Round 5, students who tested out of the first eight-hours of the course scored very well on the MOST.

The results of Round 6 indicate very little interest in the MRC on the part of newly-licensed riders--less than five percent of these individuals actually volunteered to take the MRC.

Licensure Study

As a corollary to the evaluation of the MRC, it was desirable to obtain some information concerning the extent to which exposure to the MRC increased licensure. A major concern in the evaluation of motorcycle education, in general, is whether taking a motorcycle safety course increases ridership (i.e., number of riders and/or number of miles ridden), and, therefore, exposure to accidents. It is possible that exposure increases could result in more accidents than are prevented by effective motorcycle training, and a net increase in accidents would result.

It was beyond the scope of the present project to conduct a controlled study of either changes in exposure as the result of offering the MRC or accident reduction as the result of taking the course. However, data were available which permitted a comparison of the rates of motorcycle licensure in schools with high and low participation in the MRC. The study tested two competing hypotheses. The first maintains that offering the MRC in a community (e.g., through the school system) will encourage persons who otherwise would not have ridden to obtain a license, and (by implication) ride on the street. More people will ride than otherwise would have, and exposure to accidents will increase. The alternate hypothesis contends that only persons already interested in riding will take the course, and these people would probably obtain a license and ride whether or not they take it. No increase in exposure occurs and, since a larger proportion of trained riders results from offering the course, a net reduction in accidents should occur.

Support for the first of these hypotheses could be obtained by examining the licensure rates among the 13 high schools in the Jefferson County (JEFFCO) public school systems. The need for the study did not surface until after the final round of MRC administrations had been completed. Therefore, it was not possible to examine the immediate effect, e.g., licensure changes within the first year after MRC administration. However, it was possible to study the recent (i.e., mid-1981) motorcycle licensure among persons who attended the Jefferson County high schools during the 1977-78 school year when the MRC was offered.

The 13 Jefferson County high schools each permitted their juniors and seniors to attend the MRC for credit on a voluntary basis. Participation in the MRC varied widely across schools. This was primarily due to selective recruiting (as discussed previously), rather than socioeconomic differences among the schools or other factors which could have influenced desire to ride. Participation ranged from nearly 11 percent of the juniors and seniors at one high school down to two high schools who sent no students to the MRC. If exposure to the MRC increases licensure, we would expect more of the young people who were students in the high participation schools during 1977-78 to presently have motorcycle licenses than people who were students during the same period in the low or no participation schools.

To test this hypothesis, we obtained from the Colorado Division of Motor Vehicles (CDMV) a listing of all residents of Jefferson County who presently have a motorcycle endorsement on their driver's license. The list was limited to persons born in 1960 or 1961, as these persons would be the age of juniors and seniors in the 1977-78 school year. The CDMV list was matched by name, date of birth, and (if possible) address to the comprehensive enrollment listing for the 1977-78 school year maintained by Jefferson County Public Schools. Where a match was found, the high school attended was noted on the CDMV list. The number and percent of persons with motorcycle endorsements were computed by school.

Table 4-38 summarizes the data employed in the analysis. The table shows, for all 13 high schools, the percent of the total 1977-78 junior and senior enrollment that took the MRC and the percent of those students who presently have motorcycle licenses. These latter percentage figures are

probably low, since some students with motorcycle endorsements probably have moved out of Jefferson County and are no longer licensed in Colorado. However, there is no reason to believe that this biases the data, since the decrement caused by "move-aways" should occur proportionally across all the schools.

Table 4-38

Comparison of MRC Enrollment and Subsequent  
Motorcycle Licensure by High School

<u>High School</u>	<u>Total Juniors and Seniors (1977-78 School Year)</u>	<u>Percent Taking MRC (1977-78 School Year)</u>	<u>Percent With Motorcycle License (Mid-1981)</u>
Alameda	1,115	0.63	0.45
Arvada	1,082	1.57	0.65
Arvada West	1,253	0.24	1.12
Bear Creek	960	0.10	0.73
Columbine	942	0.42	1.29
Evergreen	750	0.28	1.07
Golden	846	--	1.06
Green Mountain	947	1.16	0.42
Jefferson	616	1.14	0.97
Lakewood	1,006	6.39	0.50
Mountain Open	108	0.93	--
Pomoma	986	--	0.81
Wheatridge	1,173	10.91	0.68

It can be seen from the table that there appears to be no relationship between the percent MRC participation and the present licensure. A Pearson Product-Moment correlation was computed comparing these percentages across the 13 schools. A small negative correlation was found ( $r = -.229$ ), which was not statistically significant.

It is apparent from the table that two schools, Wheatridge and Lakewood, had high participation rates (10.9 percent and 6.4 percent, respectively) relative to the other schools. Three schools, Arvada, Green Mountain and Jefferson, had participation rates in the one to two percent range. The remaining eight schools had very low participation rates (less than one percent, with two schools having no participation). It was decided to combine licensure rates within these three groups in order to produce more stable estimates of any effect level of participation might have on licensure. The data are summarized as Table 4-39.

Table 4-39

Percent Licensure by Level of MRC Participation  
Grouped Data

<u>MRC Participation</u>	<u>No. of Schools</u>	<u>Combined Junior/ Senior Enrollment</u>	<u>Combined Percent Licensure</u>
High (6-10%)	2	2,175	0.60%
Low (1-2%)	3	2,645	0.64%
Very Low (less than 1%)	8	6,960	0.91%

The table shows that, while the licensure rates of the high and low participation groups were about equal, the very low participation groups showed higher percent licensure. The overall difference is not surprising, given the modest negative correlation reported above. What is surprising is the similarity in licensure rates between the high and low groups, then the sudden increase in the rate for the very low group. If we assume that the decisions of the students in each group to obtain a motorcycle license endorsement represent a Bernoulli process, a test of significance of the difference in licensure rates between groups can be performed based on the binomial distribution.\* Basically, the test assumes that the licensure rate for the very low participation group represents the rate to be expected where the MRC is not offered. The test then determines whether the observed difference in rate between the very low and the high group is large enough to be statistically significant. The test resulted in a  $z = 1.534$  which corresponds to a  $p = .126$  (two-tailed test). The results, therefore, are not significant at standard (i.e.,  $p < .05$ ) levels. The rates for the two groups do not differ significantly.

The interpretation of this licensure study is reasonably straightforward: There is no evidence that high schools that offered the MRC produced a higher rate of licensure than schools that did not provide students the opportunity to take the MRC.

Exposure/Transportation Mobility Study

To complement the licensure study described above, ASA requested the Jefferson County Public Schools to conduct a mail survey of MRC graduates. A survey instrument was designed to collect information concerning the following:

1. Motorcycle ownership and use.

\* For a description of this approach see Hayes, W. L. Statistics for the Social Sciences. New York: Holt, Rinehart and Winston, Inc., 1973. Chapter 5.

2. Licensure status and effect of MRC on this status.
3. Purposes served by motorcycle operation (e.g., trips to work).
4. Effect of motorcycle operation on transportation mobility and cost.

The survey instrument consisted of 17 questions which ranged from highly-structured to open-ended. A copy of this questionnaire and the accompanying cover letter are provided in Appendix E.

During the spring of 1981, the Jefferson County Public Schools mailed this survey package to a total of 329 graduates. Completed questionnaires were returned from 128 individuals, representing a response rate of 36 percent. This was considered a good response rate in view of the fact that most of the respondents took the MRC in 1977 or 1978 and that a number of the course graduates had moved out of the Metropolitan Denver area.

The detailed results of this survey are provided in Appendix D. The primary results of the survey are summarized below.

- . 128 MRC graduates completed the survey instrument (36 percent of those surveyed).
- . 62 percent (of the 128)\* MRC graduates are currently licensed to ride a motorcycle.
- . 52 percent currently own a motorcycle.
- . 17 percent had a motorcycle license prior to taking the MRC.
- . 51 percent obtained a motorcycle license during or after taking the MRC.
- . 25 percent indicated that they would not have obtained a license if they had not taken the MRC.
- . 23 percent indicated that they would have obtained a license even if they had not taken the MRC.
- . 4 percent decided not to get a license as a result of taking the MRC.
- . 70 percent have ridden a motorcycle on the street (as the driver) since taking the MRC.

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\* All of the percentages in this listing are based on the total of 128 respondents. Percentages have been rounded.

- . 40 percent currently use a motorcycle to ride to and from work an average of four times a week (during the "riding season").
- . 37 percent currently use a motorcycle for "other required trips" an average of three times per week (during "riding season").
- . 55 percent currently use a motorcycle for recreational/pleasure trips an average of two times a week (during "riding season").

In contradistinction to the licensure study data described earlier, the data from the mail survey suggest that availability of the MRC did contribute to an increase in licensure rate for the group surveyed. That is, 32 individuals, or 25 percent of those surveyed, indicated that they would not have obtained a license if they had not taken the MRC.

Given that these 32 individuals volunteered to take the MRC, it must be assumed that they had some prior interest in motorcycling, and it should, therefore, not be concluded that the MRC caused them to become licensed. The data do, however, suggest that availability of the MRC, and their participation in the course, contributed to these 32 students receiving a license.

While this increase in licensure rate may be considered undesirable from the standpoint of increased risk "exposure," it is positive in terms of increased transportation mobility at less cost than most other forms of transportation. Specifically, the survey data for questions 9 through 17 reveal that most of the licensed riders are, in fact, using a motorcycle for a variety of transportation needs, and that their use of a motorcycle has reduced their reliance on other forms of transportation.

In short, these MRC graduates are now making use of a more economical, albeit riskier, form of transportation. An obvious question is whether this increase in risk is offset by greater mobility at lower cost? Unfortunately, given the nature of this study and the variables at issue, it is not possible to specify "risk/benefit" ratios that might serve to answer this question.

SECTION 5  
RECOMMENDATIONS

Based on the results of the FTMRC, this section provides recommendations concerning the following:

1. Course Revision/Updating
2. Course Fee
3. Shorter Version of the MRC
4. Need for On-Street Training
5. Course Scheduling
6. Materials Acquisition and Facilities Preparation
7. Instructor Preparation
8. Student Recruitment

Recommendations pertaining to each of the above areas are presented in the subsections that follow.

Course Revision/Updating

For the MRC to be a maximally effective accident countermeasure, the course should be further revised/updated to address the results of the FTMRC and should incorporate other research findings that bear on motorcycle safety.

Curriculum Revisions

Throughout conduct of the FTMRC, students scored poorly on the last two exercises of the MOST (Exercise 8--Obstacle Turn, and Exercise 9--Quick Stop-Curve).

The safety criticality of these two skills--evasive turns and braking in a turn--has been demonstrated in the California Accident Factors Study.[1]. Given the importance of these emergency skills, additional research should be undertaken to develop and test improved training exercises for these two skills.

Once such training has been developed, the current MRC exercises that address these skills should be revised.

### Curriculum Additions

During the past four years, a number of important motorcycle safety research and development efforts have been completed. As appropriate, the results of these efforts should be included in the MRC. For example, the motorcycle safety implications of work in the following areas should be reflected in the MRC curriculum:

1. Motorcycle Accident Factors
2. Operator and Motorcycle Conspicuity
3. Safety Helmet Effectiveness and Usage.

While the above list is by no means complete, it suggests areas in which key findings regarding safer motorcycle operation have been specified.

Incorporation of new safety information in the MRC would not necessarily require addition of new course sessions. Rather, existing sessions should be reviewed to identify content that is vis-a-vis this new information of lower safety criticality.

For example, as discussed in the Results Section, two of the MRC Classroom Sessions (Session 1--Introduction, and Session 19--Selection, Insurance, and Maintenance) present little safety critical information and received low evaluation ratings from most students. The current contents of these sessions could be reduced or eliminated to make room for information of greater salience to motorcycle safety.

Likewise, the content of certain Range Sessions could be revamped to permit greater emphasis on the types of safety critical skills tested by the MOST.

### Course Fee

Over the last five years, the MRC has gained considerable exposure and is currently a very well-accepted program.

Given this level of acceptance and the high costs of program operation, the time has come for all course sponsors to seriously consider implementation of a course fee. In 1982 dollars, this fee should be in the range of \$65-\$85 per student.

The results of the FTMRC indicate that students are more than willing to pay a fee, and that payment of a fee has benefits beyond a source of

program income. Compared to nonpaying students, applicants who pay a fee are more likely to complete the course and show a greater interest in making up sessions for which they were absent.

### Shorter Version of the MRC

The results of the FTMRC indicate that course sponsors should consider offering at least two versions of the MRC: The full 20-hour course and a shortened 12-hour course.

Given such an arrangement, students with some prior riding experience can be pretested using the first five exercises of the MOST or the entire Range Skill Test. Applicants who pass this pretest can be assigned to a shorter version of the course that starts with Session 10 of the current MRC.

Data from the FTMRC suggests that, of all MRC applicants, 20 percent to 25 percent will "test-out" of the first part of the course. Assigning these more "advanced" students to a shorter course has three major advantages. First, it respects individual differences and, as such, helps to ensure that students receive instruction that is more tailored to their needs. Second, it permits more cost-effective allocation of instructional resources. Lastly, it results in MRC courses with more homogenous student populations. This means that instructors will not be as burdened with adjusting the pace of instruction to the "faster" or "slower" students.

### Need for On-Street Training

The "Street" versus "No-Street" evaluation described in the Results Section indicated that on-street training did not provide significantly greater skill or knowledge acquisition. As a result of this evaluation, the current version of the MRC provides on-street sessions which are optional.

The results of this evaluation should not be interpreted to mean that on-street training is of no value. Rather, the results simply mean that, using the post-treatment instruments which were available (MIT, knowledge tests, etc.), we were unable to detect significant differences between the two treatment groups.

A number of MRC course sponsors offer on-street training and strongly believe that such training develops skills and knowledge that cannot be duplicated on a driving range. Given that this is the case, additional research should be undertaken to further investigate the potential value of on-street training.

## Course Scheduling

Table 5-1 provides a summary of the different course schedules employed during the FTMRC.

Table 5-1

### Sample Course Schedules

<u>Type of Schedule</u>	<u>Time of Day</u>	<u>No. of Days</u>	<u>No. of Weeks</u>
A. In-School	2-3 p.m.	5 weekdays	5
B. After School	3-5 p.m.	2 weekdays	6
C. Late Afternoon	3-6 p.m.	5 weekdays	2
D. After Work	5-7 p.m.	3 weekdays	4
E. Summer Evening	6-8 p.m.	4 weekdays	3
F. Weeknight/Weekend	7-9 p.m. 9-Noon, 1-4 p.m.	1 weeknight 1 weekend day	4
G. Concentrated Weeknight/Weekend	7-9 p.m. 9-Noon, 1-4 p.m.	1 weeknight Sat. & Sun.	2-1/2

With the exceptions noted below, we found that all of the above schedules were administratively feasible and that each permitted offering the MRC in a manner that did not compromise instructional effectiveness, nor did they pose a problem for course enrollees.

Selection of course scheduling options must take into account three critical factors:

1. Student Population
2. Resource Availability
3. Time of Year

During the FTMRC, Schedules A, B, and C were, as might be expected, very popular with high-school students. Retired individuals and people who worked late night or early morning shifts also enrolled in Schedules B and C.

Schedules D, E, F, and G appealed mainly to adults and attracted very few high-school students. It was our impression that most high-school students do not want to be involved in "school-type" activities on weekends nor in the summer.

While the concentrated program (Schedule G) is feasible, it is recommended primarily for students who are in good physical shape and who have good motor skills (e.g., recent bicycling experience). Students who do not meet these criteria may not be able to cope with the relatively intensive nature of the training that occurs on the weekends of the concentrated program.

The after-work schedule was quite popular; however, this schedule is not feasible during months of the year when sunset occurs earlier than 7:30 p.m. Likewise, while the Summer Evening Schedule is a popular program during a hot summer, it normally cannot be used before June or after August in an area with seasons comparable to Denver.

### Materials Acquisition and Facilities Preparation

Sections 1, 3, and 4 of the MRC Instructor's Guide outline the materials and facilities necessary for conduct of the MRC. The information in the Instructor's Guide is quite helpful and should be studied before one attempts to run the MRC. Further recommendations concerning materials acquisition are provided below.

#### Motorcycles

The criticality of obtaining sufficient numbers of motorcycles before conducting the course cannot be stressed enough. The following recommendations concern the motorcycle solicitation process:

1. Solicitation of motorcycles should start well in advance of the scheduled course start date. Motorcycles acquired through the dealer loan program can take up to eight weeks to arrive once the loan form is submitted. It may take some time to convince the dealer of the merits of the MRC. The dealer may also want to think about the decision for awhile. Plan on delays.
2. A number of different dealers should be contacted in the area. Even though all dealers may not be able to participate in the program immediately, if they become aware of the program, they may participate in the future. Also, experience shows that not all dealers are able to consistently provide motorcycles. Contacting a number of dealers will help to ensure that the requisite number of motorcycles are obtained.
3. It may be necessary to convince a dealer of the loan program's merit. Intimate familiarity with the course,

insurance coverage, and the loan agreement form is needed. Dealers should be informed of the following:

- a. Financial incentives offered by the manufacturers.
  - b. Public relations benefits of supporting the MRC.
  - c. The MSF Dealer Recognition Program.
4. Trouble in obtaining motorcycles through the loan program can be resolved by contacting the Motorcycle Safety Foundation. They can often provide valuable support by directly contacting regional representatives or, if necessary, manufacturers.
5. Participating dealers should be supported. This can be accomplished in many ways, including:
- a. Purchasing necessary MRC materials (helmets, gloves, spark plugs, oil, etc.) from participating dealers.
  - b. Recognizing the dealers during the course.
6. When the motorcycles are to be returned, make sure they are clean and replace any broken parts (such as levers or mirrors). This certainly helps maintain good relations with the dealer.

#### Motorcycle Storage Area

An important assurance to dealers is that the motorcycles will be properly housed during the course. Also, insurance coverage of the motorcycles is predicated on "proper housing." When selecting a storage area, the following should be considered:

1. The storage area must be secure. Ideally, a garage, or some other portion, of a permanent building should be used. Note that building codes may prohibit storing motorcycles (flammable material--gasoline) in certain structures. If an acceptable area in a permanent building is not available, a storage shelter may need to be constructed. If this shelter is constructed within a secure area (e.g., a fenced area where driver education cars are kept), plywood siding may be adequate. If the shelter is not located in a secure area, more substantial siding (perhaps sheet metal) should be used.
2. The storage area should be close to the practice riding area (range). After the first range session, students may transport their motorcycles to and from the range,

if the storage area is close by. Also, spare motorcycles located in the storage area are accessible.

### Practice Riding Area (Range)

Every attempt should be made to obtain the use of an acceptable range area. The "Guide to Motorcycle Range Design" published by the Motorcycle Safety Foundation is an excellent source of information and should be used to guide selection and preparation of the range facility.

### Instructor Preparation

Currently, a candidate instructor who desires to teach the MRC must successfully complete an instructor preparation workshop conducted under the sponsorship of the Motorcycle Safety Foundation (MSF). MSF offers these programs at many different locations. Interested persons should contact MSF concerning their instructor preparation schedule.

In identifying candidate instructors for an MRC program, the following considerations should be made:

1. A candidate instructor must be a competent motorcyclist. In the FTMRC, instructors with weaker motorcycling abilities were generally not as proficient at teaching the MRC as were the instructors who were more accomplished motorcyclists.
2. Candidate instructors should be conscientious individuals who are truly concerned about motorcycle safety education. Instructors in the FTMRC who espoused the virtues of motorcycle safety education were generally the best instructors.
3. Candidate instructors should be serious about teaching the MRC in a thorough and correct manner. Instructors who wish to be involved in the program mainly for the money should be avoided. Likewise, instructors who show an unwillingness to follow all course requirements should not be considered.
4. Course sponsors should check with appropriate State Board of Education Officials. In many states, instructors must be certified secondary school teachers and be certified to teach high-school driver education.

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**APPENDIX A**

**SELECTED EVALUATION INSTRUMENTS:**

1. Student Questionnaires
2. Observation Forms
3. Instructor Input/Feedback Forms

**STUDENT QUESTIONNAIRES**

SIQ

MOTORCYCLE RIDER COURSE

STUDENT APPLICATION

Due to the newness of the program, enrollment in the course will be limited. Please do not complete this application unless you are serious about taking the course and know that you will be able to attend all of the classes for the section you select.

Name \_\_\_\_\_  
(Last) (First) (Middle Initial)

Home Address \_\_\_\_\_  
(Street) (City) (Zip)

Phone No. \_\_\_\_\_ Sex \_\_\_\_ Age \_\_\_\_ Birthdate \_\_\_\_\_

High School Attended \_\_\_\_\_ Home Room No. \_\_\_\_\_

Do you have a driver's license? \_\_\_\_ Yes \_\_\_\_ No  
If yes, enter license # here: \_\_\_\_\_

Have you completed the driver education course? \_\_\_\_ Yes \_\_\_\_ No

Do you have a motorcycle learner's permit? \_\_\_\_ Yes \_\_\_\_ No

Do you have a motorcycle endorsement on your license? \_\_\_\_ Yes \_\_\_\_ No

Estimate your automobile driving experience: \_\_\_\_ Years \_\_\_\_ Months driven.

Have you ever operated a motorcycle? \_\_\_\_ Yes \_\_\_\_ No  
If yes, briefly describe the extent of your experience \_\_\_\_\_

Estimate the following:

\_\_\_\_\_ years/months of riding \_\_\_\_ % street riding  
\_\_\_\_\_ total riding hours \_\_\_\_ % trail/dirt riding

Do you presently own a motorcycle or have one available to ride?

Own? \_\_\_\_ Yes \_\_\_\_ No Available? \_\_\_\_ Yes \_\_\_\_ No

If yes, what type & size? \_\_\_\_\_

Do you expect to obtain a motorcycle operator's license upon completing this course? \_\_\_\_ Yes \_\_\_\_ No

Students should provide their own ride to and from the driving range. Will you be able to get a ride?  Yes  No  
How/with whom \_\_\_\_\_

Students under 18 years of age must obtain written parental consent to take this course. Do you believe that your parents will give such consent?  
 Yes  No  Maybe.

Why are you interested in this course? Check up to two reasons

- Friends might take the course
- Seems like the best way to learn to ride
- To convince parents that motorcycle riding is OK
- It is the only way I could learn to ride
- In order to get a motorcycle license
- Because the course sounds like fun.

Where did you first learn about this course? Check one.

- Newspaper (Name of paper: \_\_\_\_\_)
- Radio spot (Name of station: \_\_\_\_\_)
- Poster (Where did you see it? \_\_\_\_\_)
- Announcement made in class/school
- Through a friend
- Other (Name source: \_\_\_\_\_)

Preferred course section (indicate section number):

- First choice: Section \_\_\_\_\_
- Second choice: Section \_\_\_\_\_
- Third choice: Section \_\_\_\_\_

Name \_\_\_\_\_

Instructor \_\_\_\_\_

Section # \_\_\_\_\_

Student # \_\_\_\_\_

(Riding Vest #)

STUDENT EVALUATION  
of  
SESSIONS 1-9

In order to make the Motorcycle Rider Course the best possible educational experience, we need to take into consideration the opinions of the students who take the course. Your feedback will help us to make it an even better course. With this objective in mind, we are asking you to complete this evaluation form covering the first half of the course (you will be asked to complete another form at the end of the course).

Carefully consider the evaluation questions that follow, and provide answers that reflect your honest opinion.

Classroom Sessions

1. Listed below is a summary of the content for the first four classroom sessions (each session was one hour in length). Please review this list. In the space provided, write a "1" for the session that you found most valuable in terms of your educational needs; write a "2" for the next most valuable. Assign each item a number so that "4" is written next to the least valuable session.

\_\_\_\_\_ Introduction to motorcycling/motorcycle controls.

\_\_\_\_\_ Protective clothing, mounting/dismounting, posture, starting, stopping, safety rules.

\_\_\_\_\_ Turning/upshifting/downshifting, braking.

\_\_\_\_\_ Being seen, communicating, following distance, IPDE, riding situations.

2. Please describe ways in which you think particular classroom sessions might be improved (for example, what content should be added or deleted).

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Range Sessions

3. Listed below is a summary of the content for the first five range sessions (each session was one hour in length). Please review this list. In the space provided, write a "1" for the session that you found most valuable in terms of your educational needs; write a "2" for the next most valuable. Assign each item a number so that "5" is written next to the least valuable session.

\_\_\_ Mounting/dismounting, starting/stopping, walking the cycle, friction point, straight line ride.

\_\_\_ Large circles, weaving, figure eights.

\_\_\_ Sharp turns, straight line shifting, turning at higher speeds.

\_\_\_ Riding slowly, braking, turning and adjusting speed.

\_\_\_ Tight circles, weaving, shifting & accelerating in a turn, braking.

4. Of the range exercises listed above (for example, tight turns), were there any that you found particularly difficult? \_\_\_ Yes \_\_\_ No. If yes, please list these exercises below and describe for each what we might have done to make these exercises easier for you to learn.

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The Range Skill Test

5. Did you pass the Range Skill Test the first time you took it? \_\_\_ Yes \_\_\_ No. If no, did you pass it the second time? \_\_\_ Yes \_\_\_ No.

6. Do you think that the Range Skill Test was a fair test of your riding ability? \_\_\_ Yes \_\_\_ No. If no, please describe why.

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Remedial Instruction

7. Have you received any remedial instruction - that is, instruction beyond that provided during the regular range sessions?  Yes  No. If yes, approximately how much time did you spend?  Hrs.  Minutes.
8. Please describe the remedial work that you did (for example, "I worked on shifting"), and the outcome of this work (for example, "It enabled me to pass the Range Skill Test").

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General Comments

9. In the space below, please provide any additional feedback concerning ways in which we might improve the course.

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Name \_\_\_\_\_

Instructor \_\_\_\_\_

Section # \_\_\_\_\_

Student # \_\_\_\_\_

(Riding Vest #)

STUDENT EVALUATION  
OF SESSIONS 10-21  
and  
OVERALL COURSE EVALUATION

Now that your work in the Motorcycle Rider Course is almost complete, we would like you to provide an evaluation of the following:

1. The specific content covered in the last half of the course.
2. The course as a whole.

Questions related to #1 appear in the first part of this form; questions concerning the course as a whole are at the end of the evaluation form.

Carefully consider the questions that follow, and provide answers that reflect your honest opinion.

Classroom Sessions

1. Listed below is a summary of the content for the last four classroom sessions (each session was one hour in length). Please review this list. In the space provided, write a "1" for the session that you found most valuable in terms of your educational needs; write a "2" for the next most valuable. Assign each item a number so that "4" is written next to the least valuable session.

\_\_\_\_\_ Application of IPDE to traffic situations

\_\_\_\_\_ Riding situations, passing, group riding, night riding, parking

\_\_\_\_\_ Advanced braking, different surfaces, standing on pegs, emergency situations, carrying passengers

\_\_\_\_\_ Selection, insurance, inspection, trouble shooting

2. Please describe ways in which you think particular classroom sessions might be improved (for example, what content should be added or deleted).

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Range Sessions

3. Listed below is a summary of the content for the last six range sessions (each session) was one hour in length. Please review this list. In the space provided, write a "1" for the session that you found most valuable in terms of your educational needs; write a "2" for the next most valuable. Assign each item a number so that "6" is written next to the least valuable session.

\_\_\_\_\_ Simulated traffic situations, passing other vehicles

\_\_\_\_\_ Turning-speed judgement, circuit training, starting on a hill

\_\_\_\_\_ Stop and go, one-hand circle and weave, diminishing lane, staggered serpentine, and engine braking

\_\_\_\_\_ Rear wheel skids, quick stops, stopping on a curve

\_\_\_\_\_ Riding on pegs, obstacles, countersteering, quick lane change, carrying passengers

\_\_\_\_\_ Pre-ride inspection, maintenance

4. Of the range exercises listed above (for example, obstacles), were there any that you found particularly difficult? \_\_\_ Yes \_\_\_ No. If yes, please list these exercises below and describe for each what we might have done to make these exercises easier for you to learn.

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The Knowledge Test

5. Do you think that the knowledge test was a fair measure of the knowledge covered by the course \_\_\_ Yes \_\_\_ No. If no, please describe why.

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OVERALL COURSE EVALUATION

Carefully consider the following items and place a check mark in one of the spots available. For each item, the position you check on each scale should reflect your honest opinion.

6. How much did you learn from the MRC?

1 _____	2 _____	3 _____	4 _____	5 _____
Significantly Less Than I Expected	Less Than I Expected	About What I Expected	More Than I Expected	Significantly More Than I Expected

7. How much did you expect to learn from the MRC?

1 _____	2 _____	3 _____	4 _____	5 _____
Very Little	Little	Wasn't Sure	A Moderate Amount	A Great Deal

8. How challenging did you find the course to be?

1 _____	2 _____	3 _____	4 _____	5 _____
No Challenge	Some Challenge	Average Challenge	Challenging	Extremely Challenging

9. How enjoyable or fun was the MRC for you?

1 _____	2 _____	3 _____	4 _____	5 _____
Extremely Boring	Boring	It Was O.K.	Enjoyable	Extremely Enjoyable

10. How would you rate your head instructor (classroom and range) for his overall performance in teaching the course?

1 _____	2 _____	3 _____	4 _____	5 _____
Very Poor Performance	Poor Performance	Average Performance	Good Performance	Excellent Performance

11. How would you rate your range instructor for his overall performance in teaching the course?

1 _____	2 _____	3 _____	4 _____	5 _____
Very Poor Performance	Poor Performance	Average Performance	Good Performance	Excellent Performance

12. I think that the time span over which the course was taught was:

1 _____	Too Short
2 _____	Too Long
3 _____	Just Right

13. Review the following list of course components. In the space provided, write in a "1" for the part of the course you felt was most effective; write in a "2" for the next most effective. Assign each item a number so that "6" is written next to the least effective component

\_\_\_\_\_ Textbook

\_\_\_\_\_ Films & Filmstrips

\_\_\_\_\_ Classroom Lectures

\_\_\_\_\_ Motorcycle Riding on the Range

\_\_\_\_\_ Motorcycle Riding on the Street

\_\_\_\_\_ Course Testing and Evaluation

14. If you could reorganize the course, on which of the above items would you spend

More Time? \_\_\_\_\_

Less Time? \_\_\_\_\_

15. Would you recommend the MRC to a friend? \_\_\_Yes \_\_\_No. If no, why not?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

16. List the three things you liked most about the MRC.

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

List the three things you liked least about the MRC.

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

17. Did you find any of the equipment unsatisfactory?      Yes      No (e.g., motorcycles, helmets, range facilities, communication gear). If yes, please describe problem:

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18. One of the evaluation sessions in the MRC required you to take the Motorcycle Operator Skill Test (MOST). How difficult for you were the exercises in the MOST?

1 <u>    </u>	2 <u>    </u>	3 <u>    </u>	4 <u>    </u>	5 <u>    </u>
Extremely	Moderately	Neither	Moderately	Extremely
Difficult	Difficult	Difficult	Easy	Easy
		Nor Easy		

19. To what extent do you feel the range exercises in the MRC prepared you for the exercises in the MOST (e.g., starting and moving up a hill, sharp turns, turning speed selection, etc.)?

1 <u>    </u>	2 <u>    </u>	3 <u>    </u>	4 <u>    </u>	5 <u>    </u>
Not At	Very	To Some	To A Great	To A Very Great
All	Little	Extent	Extent	Extent

20. Please make any additional comments or suggestions (positive or negative) concerning improving the Motorcycle Rider Course on the reverse side of this page.

#### PAST/FUTURE MOTORCYCLING ACTIVITIES

In addition to the evaluation questions above, we would like you to answer the following questions concerning your past riding experience and your plans for future riding.

21. Please estimate your riding experience prior to taking the Motorcycle Rider Course

     Years      Months of riding

     Total riding hours

     % street riding

     % trail/dirt riding

22. Do you plan to do any motorcycle riding in the next year?  Yes  No  Not Sure. If yes, please estimate approximately how many hours per month (on the average) you will ride and what type of riding you will do:

\_\_\_\_\_ hours per month

\_\_\_\_\_ % street \_\_\_\_\_ % trail

23. Will the fact that you have taken the Motorcycle Rider Course increase the amount of riding you plan to do in the future?

Yes, I plan to ride more in the future because (complete) \_\_\_\_\_

\_\_\_\_\_

No, the fact that I took the course will not influence the amount of riding I plan on doing in the future because (complete) \_\_\_\_\_

24. Do you presently own a motorcycle or have one available to ride?

Own?  Yes  No      One is available  Yes  No

If yes, what type & size? \_\_\_\_\_

25. Do you plan to purchase a motorcycle within the next year?  Yes  No  Maybe. If yes, what type and size are you thinking about?

If You Took The 20-Hour Course (Started With Session #1, And Were To Attend All 20 Hours Of Instruction) Turn To The Next Page (Page 7).

If You Tested Out Of The First 8 Hours Of Instruction (i.e., Passed On-Cycle Performance Test Given Before The Course), Turn To Page 9.

IF YOU TOOK THE 20-HOUR COURSE COMPLETE THIS PAGE AND THE NEXT PAGE  
(If you tested out of the first 8 hours of the course, skip to page 9.)

The costs of offering the MRC were partially underwritten by the U.S. Department of Transportation, the Motorcycle Safety Foundation, and the Jefferson County School District. For this reason, you paid a course fee of only \$45.00. In the future, it may be necessary to charge more for the course since these sources of support may not be available. With this possibility in mind, we would like you to address the following questions (check only one box per question):

26. Compared to other types of instruction I have paid for, I believe the MRC was well worth the \$45.00 course fee.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

---

27. I would pay \$65 to take the MRC.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

---

28. I would pay \$85 to take the MRC.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

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29. I would pay \$105 to take the MRC.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

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(continued on p. 8)

(Complete this page if you took the 20-hour course. If you tested out of the first 8 hours of the course, skip to p. 9.)

30. I would pay \$125 to take the MRC.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

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31. I would pay \$145 to take the MRC.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

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32. Please make any additional comments regarding course cost: \_\_\_\_\_

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YOU ARE NOW FINISHED WITH THIS QUESTIONNAIRE

IF YOU TESTED OUT OF THE FIRST 8 HOURS OF INSTRUCTION COMPLETE THIS PAGE AND THE NEXT TWO PAGES.

(That is, you passed on-cycle performance test given before the course.)

The costs of offering the MRC were partially underwritten by the U.S. Department of Transportation, the Motorcycle Safety Foundation, and the Jefferson County School District. For this reason, you paid a course fee of only \$25.00. In the future, it may be necessary to charge more for the course since these sources of support may not be available. With this possibility in mind, we would like you to address the following questions (check only one box per question):

26. Compared to other types of instruction I have paid for, I believe the MRC was well worth the \$25.00 course fee

Strongly  
Disagree

Disagree

Neither Agree  
nor Disagree

Agree

Strongly  
Agree

---

27. I would pay \$45 to take the 12-hour MRC.

Strongly  
Disagree

Disagree

Neither Agree  
nor Disagree

Agree

Strongly  
Agree

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28. I would pay \$65 to take the 12-hour MRC.

Strongly  
Disagree

Disagree

Neither Agree  
nor Disagree

Agree

Strongly  
Agree

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29. I would pay \$85 to take the 12-hour MRC

Strongly  
Disagree

Disagree

Neither Agree  
nor Disagree

Agree

Strongly  
Agree

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(continued on p. 10)

(Complete this page if you tested out of the first 8 hours of instruction. That is, you passed on-cycle performance test given before the course.)

30. I would pay \$105 to take the 12-hour MRC.

Strongly  
Disagree

Disagree

Neither Agree  
nor Disagree

Agree

Strongly  
Agree

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31. I would pay \$125 to take the 12-hour MRC.

Strongly  
Disagree

Disagree

Neither Agree  
nor Disagree

Agree

Strongly  
Agree

---

32. Please make any additional comments regarding course cost: \_\_\_\_\_

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Since you tested out of the first 8 hours of instruction, we are particularly interested in your response to the following questions:

33. The on-cycle performance test I took before the course seemed like a valid way of determining my pre-course riding skills.

Strongly  
Disagree

Disagree

Neither Agree  
nor Disagree

Agree

Strongly  
Agree

---

(continued on p. 11)

(Complete this page if you tested out of the first 8 hours of instruction. That is, you passed on-cycle performance test given before the course.)

34. I am pleased that I was able to test-out of the first part of the course.

Strongly  
Disagree

Disagree

Neither Agree  
nor Disagree

Agree

Strongly  
Agree

---

35. I felt that Session 9 (Range Skill Test) was the appropriate point for me to begin the course.

Strongly  
Disagree

Disagree

Neither Agree  
nor Disagree

Agree

Strongly  
Agree

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36. I would have rather taken the entire 20-hour course.

Strongly  
Disagree

Disagree

Neither Agree  
nor Disagree

Agree

Strongly  
Agree

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37. Please make any additional comments regarding the "testing-out" procedure we used:

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YOU ARE NOW FINISHED WITH THIS QUESTIONNAIRE

Motorcycle Rider Course  
Confidential Survey of Course Graduates

Please provide complete and honest answers to the following questions and return the questionnaire in the enclosed envelope as soon as possible.

Thank you!

Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_ Phone No. \_\_\_\_\_

Birthdate \_\_\_\_\_ Sex: \_\_\_\_\_

Male Female

High School Attended \_\_\_\_\_

Driver's License: State \_\_\_\_\_ Operator # \_\_\_\_\_

1. Did you have a motorcycle endorsement on your driver's license before taking the Motorcycle Rider Course?

\_\_\_\_\_ Yes (Go to question 4)

\_\_\_\_\_ No (Go to question 2)

2. Have you obtained a regular motorcycle license since graduating from the Motorcycle Rider Course?

\_\_\_\_\_ Yes If yes, in what month did you take your on-cycle licensing test: Month \_\_\_\_\_ (Go to question 4)

\_\_\_\_\_ No (Go to question 3)

3. If you have not obtained a motorcycle driver's license, we would like to get some idea of when you will and/or why you haven't. Please check all the reasons below that apply to you.

\_\_\_\_\_ I seriously plan to take the on-cycle licensing test within the next \_\_\_\_\_ months.  
(fill in no.)

\_\_\_\_\_ A motorcycle has not been available for me to take the test on; otherwise, I would have obtained my license.

(Reasons cont'd on next page.)

I am not interested in getting a license to ride on the street at this time.

       I would like to get a license, but my parents will not permit me to do so at this time.

       I attempted to get a license but failed the motorcycle riding test.

Other Reasons \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4. Have you done any motorcycle riding (as the driver) since graduating from the Motorcycle Rider Course?

       Yes (Go to question 5)

       No (You have completed the questionnaire)

5. We would like to get an idea of how much riding (as the driver) you have done since completing the Motorcycle Rider Course. In the space below, please estimate by month the number of miles you have ridden (street/trail). A good way to estimate past miles ridden is to think about the number of hours you typically rode on a weekly basis, and your average speed. Multiply the hours by the speed and then multiply this number by 4.5 (weeks) to get a monthly estimate of miles ridden. Example: 10 hrs. per week at an average speed of 35 = 10 hrs. X 35 mph = 350 miles. 350 miles X 4.5 weeks per month = 1,575 miles.

Please complete all blanks. For months in which you did not ride, use "0's" to designate no miles. Do not include time spent riding during the Motorcycle Rider Course in these estimates.

<u>Month</u>	<u>Est. of total street Riding Miles</u>	<u>Est. of total trail Riding Miles</u>
Jan. 1978	_____	_____
Feb. 1978	_____	_____
Mar. 1978	_____	_____
Apr. 1978	_____	_____
May 1978	_____	_____

6. Did you own a motorcycle before taking the Motorcycle Rider Course?

       Yes If yes, please describe type of machine:

Make \_\_\_\_\_ Size in cc \_\_\_\_\_

       No

7. Have you purchased a motorcycle since taking the Motorcycle Rider Course?

       Yes If yes, please describe type of machine.

Make \_\_\_\_\_ Size in cc \_\_\_\_\_

       No, but have one available to ride. Please describe whose bike(s) you are riding \_\_\_\_\_

       No, but plan to within the next \_\_\_\_\_ months.  
(fill in no.)

       No, and don't plan to within the foreseeable future.

8. Unfortunately, motorcycle accidents or mishaps are not uncommon. Hopefully, you have not had any. If you have, it is very important that we learn something about them. (Let me re-emphasize that the information you provide will be treated as strictly confidential. It will be used solely for purposes of improving the Motorcycle Rider Course.) We are interested in any motorcycle "accident" in which one or more of the following occurred:

1. You struck an object. For example, you ran into any of the following: car, pedestrian, fence, pole, etc.
2. You skidded or slid and dropped your motorcycle. For example, to avoid hitting a car you locked the rear brake, slid out and went down.
3. You lost control of the motorcycle and unintentionally left the roadway. For example, you slid on gravel and went over the shoulder of the roadway.

Since completing the Motorcycle Rider Course, have you had any accidents (as defined above)?        Yes        No (Go to question 9)

If yes, how many \_\_\_\_\_.

For each accident, please fill in the information requested below (consider your most recent accident as #1, next most recent #2, etc.):

	Accident 1	Accident 2	Accident 3	Accident 4
MONTH (fill in box) . . . . .	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
TYPE OF ACCIDENT . . . . . (Place appropriate Item Number in box)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1. Collided with another vehicle (car, van, truck)				
2. Collided with fixed object (tree, pole)				
3. Collided with pedestrian				
4. Skidded/slid out and dropped cycle (no other vehicle involved, no ob- ject struck)				
5. Left roadway (e.g., went over embankment - no other vehicle involved, no ob- ject struck)				
TYPE OF ROAD . . . . . (On which accident occurred)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1. Paved public road				
2. Unpaved public road				
3. Off public road (e.g., trail or dirt riding)				
PERSONAL INJURY . . . . . (Consider only yourself)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1. None				
2. Minor (cuts, bruises)				
3. Serious (broken bones, cuts requiring stitches)				
4. Severe (ambulance took me from scene)				
PROPERTY DAMAGE . . . . . (To your cycle)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1. None				
2. Minor (dents and scratches costing up to \$50 to repair)				
3. Some serious damage (cost \$50-\$250)				
4. Severe damage (cost over \$250)				

9. Since completing the Motorcycle Rider Course, how many "near misses" (almost a motorcycle accident as defined above) have you experienced?

Total number of near misses: \_\_\_\_\_

10. Please break down your total number of near misses into the following location

\_\_\_\_\_ On public roads (paved and unpaved)

\_\_\_\_\_ Off public roads (e.g., trail/dirt)

11. Percent of time you wear a safety helmet when riding?

\_\_\_\_\_ Never wear one

\_\_\_\_\_ Approximately 25% of the time

\_\_\_\_\_ Approximately 50% of the time

\_\_\_\_\_ Approximately 75% of the time

\_\_\_\_\_ Always wear one

12. Percent of time you wear high visibility clothing when riding?

\_\_\_\_\_ Never wear it

\_\_\_\_\_ Approximately 25% of the time

\_\_\_\_\_ Approximately 50% of the time

\_\_\_\_\_ Approximately 75% of the time

\_\_\_\_\_ Always wear it

13. Percent of time you ride with your headlight on during the daytime?

\_\_\_\_\_ Never

\_\_\_\_\_ Approximately 25% of the time

\_\_\_\_\_ Approximately 50% of the time

\_\_\_\_\_ Approximately 75% of the time

\_\_\_\_\_ Always

OBSERVATION FORMS

CLASSROOM OBSERVATION RECORD

SESSION 2

Date \_\_\_\_\_  
 Observer \_\_\_\_\_  
 Course \_\_\_\_\_  
 Instructor \_\_\_\_\_

Rating Scale:

- 0 - Not Observed
- X - Inadequate
- ✓ - Adequate

EVALUATION/RATING

SESSION CONTENT COMPONENTS	EVALUATION/RATING					Comments, Problems
	Content Coverage	Instructor Activities	Use of Materials	Time Spent (Mins.)		
A. Overview/Film Strip						
B. Helmets						
C. Eye/Face Gear						
D. Clothing						
E. Gloves						
F. Shoes						
G. Mounting/Dismounting						
H. Posture						
I. Fine-C						
J. Starting/Stopping Engine						
K. Underway/Stopping						
L. Safety Rules						
M. Hand Signals						
N. Range Preparation						
				Total Time		

OVERALL RATINGS FOR SESSION (Check Appropriate Box)	RATING					Comments, Problems
	Good	Adequate	Poor	Not Performed	Not Applicable	
1. Introduction/Overview of Session						
2. Instructor(s) Elicits Class Participation						
3. Student Interest/ Involvement						
4. Session Transition (e.g., Range Prep., Homework Assignments)						
5. Overall Session Quality.						

ASK INSTRUCTOR FOR IMPRESSIONS/SUGGESTIONS-NOTE ON REVERSE SIDE

CLASSROOM OBSERVATION RECORD

SESSION 10

Date \_\_\_\_\_  
 Observer \_\_\_\_\_  
 Course \_\_\_\_\_  
 Instructor \_\_\_\_\_

Rating Scale:

- 0 - Not Observed
- X - Inadequate
- ✓ - Adequate

EVALUATION/RATING

SESSION CONTENT COMPONENTS	Content Coverage	Instructor Activities	Use of Materials	Time Spent (Mins.)	Comments, Problems
A. Street Riding Problems					
B. Overview/Film					
C. Communicating					
D. Lane Positioning					
E. Scanning Reasons					
F. Scanning Procedures					
G. Looking Ahead					
H. Looking Side to Side					
I. Looking to Rear					
				Total Time	

OVERALL RATINGS FOR SESSION (Check Appropriate Box)	Good	Adequate	Poor	Not Performed	Not Applicable	Comments, Problems
1. Introduction/Overview of Session						
2. Instructor(s) Elicits Class Participation						
3. Student Interest/ Involvement						
4. Session Transition (e.g., Range Prep., Homework Assignments)						
5. Overall Session Quality.						

ASK INSTRUCTOR FOR IMPRESSIONS/SUGGESTIONS--NOTE ON REVERSE SIDE

**RANGE OBSERVATION RECORD**  
 Session 7 Exercise 17

Date \_\_\_\_\_  
 Observer \_\_\_\_\_  
 Section # \_\_\_\_\_  
 Instructor \_\_\_\_\_  
 Range Inst. \_\_\_\_\_  
 Number of Students  
 Present \_\_\_\_\_  
 Absent \_\_\_\_\_

**RIDING SLOWLY**

Time: *10 min.*

Time Spent: \_\_\_\_\_

**OBJECTIVE**

Students must be able to balance a motorcycle while riding slowly and slipping the clutch to control the motorcycle's speed.

**DIRECTIONS**

1. Assign students to cones 1 through 12, with the front wheel placed to the right of the cone.
2. Instruct the students to do the following:
  - a. On command, begin riding toward the target cone as slowly as possible.
  - b. Repeat the drill 5 times.
3. After the last trial, instruct the students to assemble for instructions.

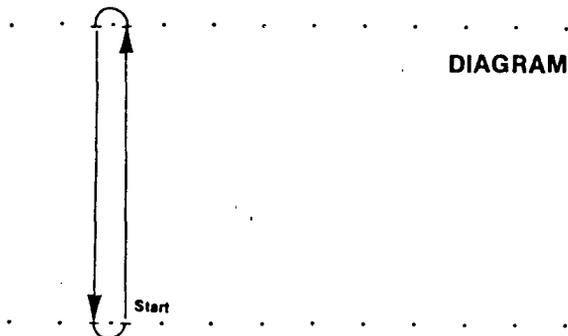
**COACHING TIPS**

1. Stand in front of the motorcycles.
2. Listen to the motorcycle engines for evaluating engine control.
3. Emphasize that this is not a contest but skill development.
4. Emphasize that the students *must* slip the clutch.

**STUDENT EVALUATION**

Rating Scale: 0 - Not Observed, X - Inadequate, ✓ - Adequate

St. #	1. Rides straight	2. Feet do not touch the ground	3. Does not stall engine	4. Keeps head and eyes up	5. Does not overrev or lug engine	6. Slips clutch



**NOTES:**

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**RANGE OBSERVATION RECORD**  
**Session 7 Exercise 18**

Date \_\_\_\_\_  
 Observer \_\_\_\_\_  
 Section # \_\_\_\_\_  
 Instructor \_\_\_\_\_  
 Range Inst. \_\_\_\_\_  
 Number of Students  
 Present \_\_\_\_\_  
 Absent \_\_\_\_\_

**USING BOTH BRAKES TO STOP AT A DESIGNATED POINT**

Time: *20 min.*

Time Spent: \_\_\_\_\_

**OBJECTIVE**

Students must be able to use both brakes to come to a smooth stop at a designated point.

**DIRECTIONS**

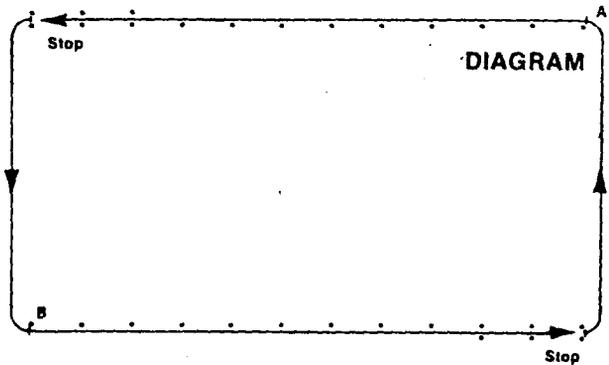
1. Assign 6 motorcycles to Point A and 6 motorcycles to Point B.
2. Instruct the students to do the following, one at a time:
  - a. Approach the stopping area at 15 mph in second gear, apply both brakes, and stop within one foot of the stop line.
  - b. Repeat the drill at 20 mph.
3. Instruct the students to pull over to the side and wait for instructions after taking their turns at the exercise.

**COACHING TIPS**

1. Wave off students going too fast.
2. Watch for wrist position on throttle hand — causes overrevving.
3. Watch for dip of the front end to identify use of the front brake.
4. Watch for students who wobble on approach. (These students sometimes turn the handlebars when stopping.)
5. Make sure the riders keep their heads and eyes up, looking straight ahead.

**STUDENT EVALUATION**

Rating Scale: 0 - Not Observed, X - Inadequate, ✓ - Adequate



St. #	1. Uses both brakes	2. Does not stall, lug, or overrev engine	4. Stops in a straight line	5. Downshifts to first gear	6. Left foot is first to the ground	7. Stops within one foot of the end line

**NOTES:**

**RANGE OBSERVATION RECORD**  
**Session 7 Exercise 19**

Date \_\_\_\_\_  
 Observer \_\_\_\_\_  
 Section # \_\_\_\_\_  
 Instructor \_\_\_\_\_  
 Range Inst. \_\_\_\_\_  
 Number of Students  
     Present \_\_\_\_\_  
     Absent \_\_\_\_\_

**USING BOTH BRAKES TO STOP**

Time: *20 min.*

Time Spent: \_\_\_\_\_

**OBJECTIVE**

Students must be able to come to a gradual stop using both brakes. They must be able to maintain brake pressure with the front brake lever and hold the front wheel straight ahead when stopped.

**DIRECTIONS**

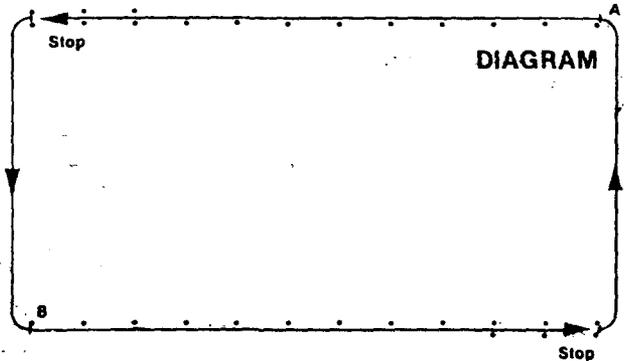
1. Assign 6 motorcycles to Point A and 6 motorcycles to Point B.
2. Instruct the students to do the following, one at a time:
  - a. Approach the stopping area at 15 mph in second gear and apply both brakes after the front tire passes the first set of cones.
  - b. Repeat the drill at 20 mph.
3. Instruct the students to pull over to the side and wait for instructions after taking their turns at the exercise.

**COACHING TIPS**

1. Stand to the left side of the stopping area to facilitate grabbing the clutch.
2. Wave off students going too fast.
3. Watch for wrist position on throttle hand — causes overrevving.
4. Watch for dip of front end to identify use of front brake.
5. Watch for students who wobble on approach. (These students sometimes turn the handlebars when stopping.)
6. Make sure the riders keep their heads and eyes up looking straight ahead.

**STUDENT EVALUATION**

Rating Scale: 0 - Not Observed, X - Inadequate, ✓ - Adequate



St. #	1. Uses both brakes	2. Does not stall, or overrev the engine	3. Does not skid	4. Stops in a straight line	5. Downshifts to first gear	6. Left foot is first to the ground

**NOTES:**

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



**RANGE OBSERVATION RECORD**  
 Session 17 Exercise 29

Date \_\_\_\_\_  
 Observer \_\_\_\_\_  
 Section # \_\_\_\_\_  
 Instructor \_\_\_\_\_  
 Range Inst. \_\_\_\_\_  
 Number of Students  
 Present \_\_\_\_\_  
 Absent \_\_\_\_\_

**QUICK STOPS**

**OBJECTIVE**

Students must be able to bring the motorcycle to a stop in the shortest distance.

Time: 20 min.

Time Spent: \_\_\_\_\_

**DIRECTIONS**

1. Assign 6 riders to Point A and 6 riders to Point B.
2. Instruct the students to do the following, one at a time:
  - a. Enter the braking area at 15 mph in second gear and stop in the shortest distance using both brakes.
  - b. Repeat exercise at 20 mph.
3. Stop the exercise and give directions for the next exercise.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**COACHING TIPS**

1. Stress the importance of the increased use of the front brake.
2. Warn the students of the danger of front wheel lock and of the need to keep the wheel straight.
3. If riders are doing well, instruct them to make stops on your signal rather than when they pass the cone.
4. Emphasize that an "impending skid" (just short of a lock in the rear wheel) is the optimum braking condition.

\_\_\_\_\_

\_\_\_\_\_

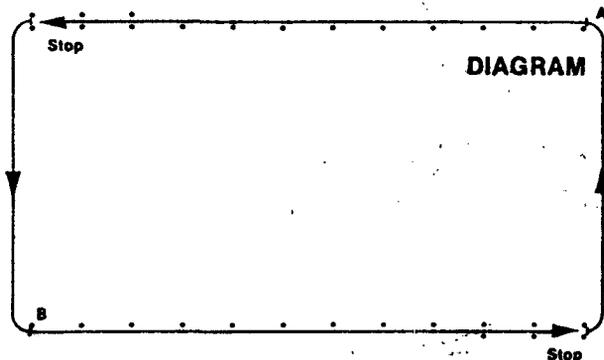
\_\_\_\_\_

\_\_\_\_\_

**STUDENT EVALUATION**

Rating Scale: 0 - Not Observed, X - Inadequate, ✓ - Adequate

1. Keeps the front wheel pointed straight ahead
2. Does not release the rear brake until completely stopped
4. Attains prescribed speed
5. Keeps head and eyes up
6. Applies front wheel brake (jerk or grab)
7. Accomplishes braking in the shortest distance with rear wheel "impending skid" (steady pressure - no jerk or grab)



St. #	1	2	4	5	6	7

**NOTES:**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**RANGE OBSERVATION RECORD**  
 Session 18 Exercise 31

Date \_\_\_\_\_  
 Observer \_\_\_\_\_  
 Section # \_\_\_\_\_  
 Instructor \_\_\_\_\_  
 Range Inst. \_\_\_\_\_  
 Number of Students  
 Present \_\_\_\_\_  
 Absent \_\_\_\_\_

**RIDING ON THE PEGS**

Time: 10 min.

**OBJECTIVE**

Students must be able to control the motorcycle while operating in a standing-up position.

Time Spent: \_\_\_\_\_

**DIRECTIONS**

1. Assign 3 riders to each 60' circle and 6 riders to the perimeter weave ride.
2. Instruct the students to do the following:  
Ride the prescribed path in a standing-up position in first gear.
3. Rotate the groups from the circles to the perimeter weave.
4. Put all riders on the perimeter and stop the exercise. Instruct the students to line up in two rows of six and give instructions for the next exercise.

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**COACHING TIPS**

1. Make sure riders do not lock elbows or knees. (Knees resting on the tank)
2. Make sure riders keep heads and eyes up.
3. Make sure circles and perimeter weave are ridden in the same direction.
4. Alert students to the sensitivity (difference in feel) of the throttle and brake when standing up.
5. Remind students they *do not* have to stand straight up — just assume a crouched position with back fairly straight and the knees and elbows flexible.
6. Advise students to sit down if they get tired.

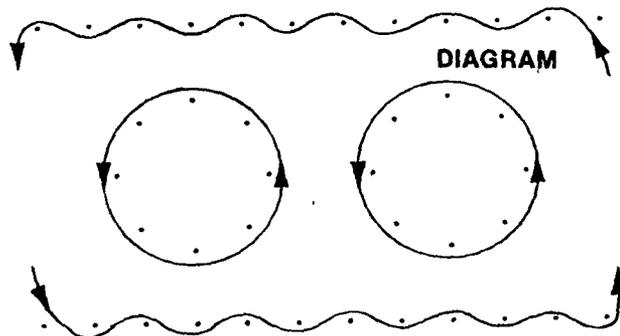
\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**STUDENT EVALUATION**

Rating Scale: 0 - Not Observed, X - Inadequate, ✓ - Adequate

- St. #
1. Grips handlebars firmly
  2. Raises body from cycle
  3. Does not lock knees
  4. Keeps weight off handlebars
  5. Keeps knees on tank

St. #	1	2	3	4	5	
						/ / / / /
						/ / / / /
						/ / / / /
						/ / / / /
						/ / / / /
						/ / / / /



**NOTES:**

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**RANGE OBSERVATION RECORD**  
 Session 18 Exercise 52

Date \_\_\_\_\_  
 Observer \_\_\_\_\_  
 Section # \_\_\_\_\_  
 Instructor \_\_\_\_\_  
 Range Inst. \_\_\_\_\_  
 Number of Students  
     Present \_\_\_\_\_  
     Absent \_\_\_\_\_

**CROSSING OBSTACLES**

Time: 15 min.

Time Spent: \_\_\_\_\_

**OBJECTIVE**

Students must be able to cross an obstacle by standing on the pegs.

**DIRECTIONS**

1. Place obstacles (2 x 4's, 4 x 4's, etc.) on the range at 40' intervals.
2. Instruct the students to do the following, one at a time:  
 Surmount the obstacles one at a time at as close to a 90 degree angle as possible.
3. Stop the exercise and give directions for the next exercise.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**COACHING TIPS**

1. Make sure less advanced riders do not overstep their ability.
2. Check wrist position on right hand. **DO NOT ALLOW** an exaggerated wrist-up position.

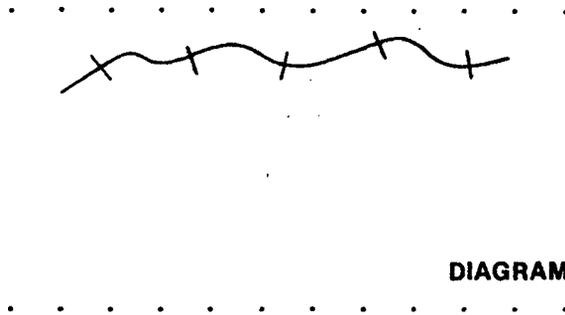
\_\_\_\_\_

\_\_\_\_\_

**STUDENT EVALUATION**

Rating Scale: 0 - Not Observed, X - Inadequate, ✓ - Adequate

- 2. Raises body from motorcycle
- 3. Does not lock knees
- 4. Keeps weight off handlebars
- 5. Keeps knees on tank
- 6. Shifts weight back as front wheel crosses obstacles
- 7. Shifts weight forward as rear wheel crosses obstacles



**DIAGRAM**

St. #	2. Raises body from motorcycle	3. Does not lock knees	4. Keeps weight off handlebars	5. Keeps knees on tank	6. Shifts weight back as front wheel crosses obstacles	7. Shifts weight forward as rear wheel crosses obstacles

**NOTES:**

ON STREET OBSERVATION RECORD

Session \_\_\_\_\_

Time: 60 Min.

Date \_\_\_\_\_ Observer \_\_\_\_\_

Course \_\_\_\_\_ Instructor \_\_\_\_\_

Number of Students: Present \_\_\_ Absent \_\_\_

INTERMEDIATE STREET RIDE

DIRECTIONS:

1. Starts on Time
2. Conducts Pre-ride Insp.
3. Explains Signals/Rules
4. Explains Route
5. Checks Communication Links
6. Assigns Group Positions
7. Maintains Proper Formation

Check if Performed

<input type="checkbox"/>	_____

8. Follows Route
9. Gives Directional Comments early enough
10. Talks Clearly
11. Identifies Student for Comment
12. Corrects Dangerous Actions
13. Changes Leaders
14. Keeps Group Together

Check if Performed

<input type="checkbox"/>	(list errors) _____
<input type="checkbox"/>	_____
<input type="checkbox"/>	_____
<input type="checkbox"/>	_____
<input type="checkbox"/>	_____
<input type="checkbox"/>	_____
<input type="checkbox"/>	_____

TASKS

St. #	Name	CYCLE CONTROL							
		Rt. Turn	Left Turn	Thru	Group Riding	Shifting	Braking	Turning	Law Obeying
A-34									

COMMENTS:

St. #	Comments

St. #	Name	TURN WITH TRAFFIC			VEHICLE ON SIDE			CURVE		FOLLOW. DISTANCE		MERGE						
		Correct Gap Accept.	Proper Position	Gives Rt. of Way	Lateral Position	Speed Adjust.	Moves out of Blind Spot	Maintains Position	Adjusts Speed	2 Sec.	Adjusts by Sight Ahead	Signals	Shoulder Check	Adjusts Speed	Accepts Safe Gap	Cancel Signal	Maintains Speed of Traffic	Adjusts Lane Position for Hazards

Check Box Each Time Student Performs Incorrectly

**INSTRUCTOR INPUT/FEEDBACK FORMS**

INSTRUCTOR INPUT/FEEDBACK: CLASSROOM SESSION  
SESSION 1

Date \_\_\_\_\_  
Observer \_\_\_\_\_  
Section \_\_\_\_\_  
Instructor \_\_\_\_\_

SESSION CONTENT COMPONENTS	EVALUATION/RATING				
	SESSION CONTENT	DIRECTIONS RE ACTIVITIES	MATERIALS & EQUIPMENT	TIME ALLOCATION	
A. Intro Remarks/Film					Rating Scale: 0 - Not Available X - Inadequate ✓ - Adequate
B. Purpose of Course					
C. Overview/Film Strip					
D. Controls					
			Total Time		

A. How much time did you spend preparing for this session (check one).  
 1. \_\_\_ less than 15 min. 2. \_\_\_ 15-30 min. 3. \_\_\_ 30-45 min. 4. \_\_\_ 45-60 min.  
 5. \_\_\_ 60-75 min. 6. \_\_\_ 75-90 min. 7. \_\_\_ 90-105 min. 8. \_\_\_ 105-120 min.

B. Is there content/materials/procedures that, in your judgment, should be added to this session? 1. \_\_\_ Yes 2. \_\_\_ No. If yes, describe \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

(over for additional comments)

C. Is there content/materials/procedures that, in your judgment, should be deleted from this session? 1. \_\_\_ Yes 2. \_\_\_ No. If yes, describe \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

D. Class response (i.e., participation, questions, etc.) to session was (check one):  
 1. \_\_\_ Good 2. \_\_\_ Adequate 3. \_\_\_ Poor.  
 If you checked 2 or 3, describe what could/should be done to improve class response  
 \_\_\_\_\_  
 \_\_\_\_\_

E. Other input/feedback re problems in preparing/conducting session and/or recommendations to improve sessions \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

INSTRUCTOR INPUT/FEEDBACK

Street Test  
(Session 23)

1. Are the scoring criteria for the street test (provided on pages 5-111 - 5-117) clear? If not, identify criteria that you found ambiguous and/or difficult to apply.

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2. In your judgment, was the street test that we employed an adequate test of street riding skills? (For example, did you pass any students that you think should really not be on the street?) Identify problems with the tests, and procedures/scoring criteria that could be modified to improve the test.

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3. Was our street test route adequate in terms of the scoring checks that we employed? If not, how might the route be improved?

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4. General comments: \_\_\_\_\_

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INSTRUCTOR INPUT/FEEDBACK

Range Exercise 1  
Mounting and Dismounting the Motorcycle

1. Is the exercise adequate in terms of teaching the skills specified in the objectives? Identify specific problems and possible additions/revisions to correct these problems. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. Directions to teacher - are they: Clear? If unclear, specify problem. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

. Appropriate? If not, identify possible modifications. \_\_\_\_\_  
\_\_\_\_\_

. Complete? If not, what needs added? \_\_\_\_\_  
\_\_\_\_\_

3. Coaching Tips - are they: Clear? If unclear, specify problem. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

. Appropriate? If not, identify possible modifications. \_\_\_\_\_  
\_\_\_\_\_

. Complete? If not, what needs added? \_\_\_\_\_  
\_\_\_\_\_

4. Evaluation criteria - are they: Behaviors that can be observed? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

. Complete enough to address all elements of the objectives? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

5. Time specified for exercise - Adequate? Too long, too short? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. General Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

APPENDIX B

PROJECT MEMOS

1. Input to Plan for Motorcycle Demonstration Project.
2. Cost Estimates for Training Aspect of Motorcycle Demonstration Project.

Contract No. DOT-HS-7-01635  
Field Test of a Motorcycle Safety Education  
Course for Novice Riders

PROJECT MEMO: INPUT TO PLAN FOR  
MOTORCYCLE DEMONSTRATION PROJECT

Prepared by:

Richard M. Thackray, Jr.  
Project Director

Prepared for:

Department of Transportation  
National Highway Traffic Safety Administration  
Room 3112, Transpoint Building  
Washington, D.C. 20590

8 September 1978

## INTRODUCTION

The purpose of this memo is to provide input to the demo project planning that is based upon the current results of the Field Test of a Motorcycle Rider Course.

The memo is divided into three sections:

1. Overview of Enrollment Data and User Acceptance Data for Rounds 1-4.
2. Licensure/Riding Data.
3. Preliminary Evaluation Plan for Demo Project.

## SECTION 1

### OVERVIEW OF ENROLLMENT DATA AND USER ACCEPTANCE DATA FOR ROUNDS 1-4

The purpose of this section is to provide an overview of enrollment data and user acceptance data for Rounds 1-4 of the Field Test of a Motorcycle Rider Course (FTMRC). Data that appear to be of particular importance for demo project planning will be emphasized.

#### Enrollment Data

To date, four Rounds of the MRC have been conducted as part of the FTMRC.

Table 1 presents a breakdown of Round 1-4 enrollment data for high school students and adults. Examination of these data reveals the following important points:

1. Across all rounds, the completion rate was 68.5%.
2. The completion rate for high school students (69.3) and adults (67.7) does not appear to differ substantially.
3. Adult interest in the course increased considerably from Round 1 to Round 4.

#### Completion Rates

Examination of the completion rates for each round, and by high school students vs adults, shows that, while these rates vary somewhat, the amount of variation is not great. Therefore, we believe that the overall completion rate of 68.5% is likely representative of the completion rate to be expected in the demo project (assuming a similar pool of students).

#### Adult Interest

Point 3 above is of considerable importance since, as will be described later, the licensure rate for adults has been found to be considerably higher than the rate for students.

Thus, the reason for increased adult interest deserves additional comment. Recruitment efforts for the FTMRC were primarily focussed in four Jefferson County high schools. Newspaper ads were, however, run for one

Table 1-1  
Enrollment Data  
by High School Students/Adults  
for Rounds 1-4\*

<u>Round/Age Category**</u>	<u>Started Course</u>		<u>Completed Course</u>		<u>% Comp</u>
	<u>n</u>	<u>Col %</u>	<u>n</u>	<u>Col %</u>	
<b>Round 1 (9/77-10/77)</b>					
H.S. Students	119	76.8	84	77.1	70.5
Adults	<u>36</u>	<u>23.2</u>	<u>25</u>	<u>22.9</u>	<u>69.4</u>
	155	100.0	109	100.0	70.3
<b>Round 2 (11/77-12/77)</b>					
H.S. Students	58	45.3	39	47.0	67.2
Adults	<u>70</u>	<u>54.7</u>	<u>44</u>	<u>53.0</u>	<u>62.9</u>
	128	100.0	83	100.0	64.8
<b>Round 3 (4/78-5/78)</b>					
H.S. Students	48	44.9	35	47.3	72.9
Adults	<u>59</u>	<u>55.1</u>	<u>39</u>	<u>52.7</u>	<u>66.1</u>
	107	100.0	74	100.0	69.1
<b>Round 4 (6/78-8/78)</b>					
H.S. Students	13	12.7	7	9.9	53.8
Adults	<u>89</u>	<u>87.3</u>	<u>64</u>	<u>90.1</u>	<u>71.9</u>
	102	100.0	71	100.0	69.6
<b>Round 1-4 Summary</b>					
H.S. Students	238	48.4	165	49.0	69.3
Adults	<u>254</u>	<u>51.6</u>	<u>172</u>	<u>51.0</u>	<u>67.7</u>
	492	100.0	337	100.0	68.5

\*These data do not include 8 students in Round 2 for whom certain demographic data was missing.

\*\*Adults defined as individuals 18 and older.

day in one or two Denver newspapers prior to Rounds 1, 2 and 4. Initially, (i.e., Rounds 1 and 2), the majority of the adults that signed up heard about the course through these ads. However, by the Spring of 1978, many adults had learned about the course through word of mouth. Thus, as the course became more visible in the community, adult interest seemed to increase. On the other hand, given a finite number of potential students in the four high schools, as the course was offered more often, this supply of students dwindled.

Given the modest recruitment effort aimed at adults, the numbers of adults who took the course is impressive. It is our current judgment that a rather large scale city wide recruitment effort would result in a very substantial enrollment by adults.

By "large scale" recruitment we mean the following type of effort prior to each round:

- Newspaper display ads that would run 4-7 days in 2 or 3 of Denver's papers.
- Radio and TV PSAs.
- Posters in the majority of motorcycle shops in Denver.

#### User Acceptance Data

The general acceptability of the MRC to individuals who take the course, and to the parents of high school students, should be of interest in demo project planning.

Exhibit 1 provides a summary of student response to the course. These data, based on responses from a total of 179 Round 1 and 2 graduates, reveal that the course received very high ratings from close to 90% of the students.

Exhibit 2 provides a summary of parent response to the course. These data indicate that, in general, parents believed that their son/daughter benefited from the course. Of particular note is the fact that 95% of the parents felt that it is appropriate to offer such a course through the schools.

The user acceptance data referred to above is clearly favorable. These data suggest that in a properly conducted program, the MRC should be well received in the types of settings being considered for the demo.

Exhibit 1-1

SUMMARY OF OVERALL COURSE EVALUATION DATA\*

Carefully consider the following items and place a check mark in one of the spots available. For each item, the position you check on each scale should reflect your honest opinion.

10. How much did you learn from the MRC?

1 <u>1.7%</u>	2 <u>0.6%</u>	3 <u>18.3%</u>	4 <u>46.7%</u>	5 <u>32.8%</u>
Significantly Less Than I Expected	Less Than I Expected	About What I Expected	More Than I Expected	Significantly More Than I Expected

11. How much did you expect to learn from the MRC?

1 <u>1.1%</u>	2 <u>5.5%</u>	3 <u>32.6%</u>	4 <u>36.5%</u>	5 <u>24.3%</u>
Very Little	Little	Wasn't Sure	A Moderate Amount	A Great Deal

12. How challenging did you find the course to be?

1 <u>3.9%</u>	2 <u>14.0%</u>	3 <u>26.3%</u>	4 <u>43.0%</u>	5 <u>12.8%</u>
No Challenge	Some Challenge	Average Challenge	Challenging	Extremely Challenging

13. How enjoyable or fun was the MRC for you?

1 <u>0.6%</u>	2 <u>0.0%</u>	3 <u>10.6%</u>	4 <u>38.5%</u>	5 <u>50.3%</u>
Extremely Boring	Boring	It Was O.K.	Enjoyable	Extremely Enjoyable

14. How would you rate your head instructor (classroom and range) for his overall performance in teaching the course?

1 <u>0.0%</u>	2 <u>0.6%</u>	3 <u>4.5%</u>	4 <u>29.6%</u>	5 <u>65.4%</u>
Very Poor Performance	Poor Performance	Average Performance	Good Performance	Excellent Performance

15. How would you rate your range instructor for his overall performance in teaching the course?

1 <u>0.6%</u>	2 <u>2.2%</u>	3 <u>5.6%</u>	4 <u>33.0%</u>	5 <u>58.7%</u>
Very Poor Performance	Poor Performance	Average Performance	Good Performance	Excellent Performance

16. I think that the time span over which the course was taught was:

1 <u>22.5%</u>	Too Short
2 <u>16.9%</u>	Too Long
3 <u>60.7%</u>	Just Right

\* Entries based on responses from 179 graduates of Rounds 1 and 2.

SUMMARY OF PARENT QUESTIONNAIRE DATA\*

Student's Name \_\_\_\_\_

Date \_\_\_\_\_

Your Name \_\_\_\_\_

Address \_\_\_\_\_

Relationship to Student \_\_\_\_\_

1. Does anyone in your family presently own or operate a motorcycle?      Yes      No  
If yes, check appropriate person(s):

- Self
- Spouse
- Student named above
- Other children
- Other family member

2. Do you approve of the regular use of a motorcycle by immediate family members?  
48%Yes 30%No 22%Maybe.

3. Please indicate the degree of comfort with which you initially permitted your son/daughter to take the rider course (i.e., how you felt before the course):

<u>29%</u>	<u>35%</u>	<u>0%</u>	<u>24%</u>	<u>12%</u>
Very Comfortable	Somewhat Comfortable	No Opinion	Somewhat Uncomfortable	Very Uncomfortable

4. How comfortable would you be making the same decision today?

<u>53%</u>	<u>29%</u>	<u>0%</u>	<u>18%</u>	<u>0%</u>
Very Comfortable	Somewhat Comfortable	No Opinion	Somewhat Uncomfortable	Very Uncomfortable

5. How much change in your son's/daughter's attitudes about safe riding has occurred as a function of the rider course?

<u>0%</u>	<u>11%</u>	<u>21%</u>	<u>43%</u>	<u>25%</u>
Worse Attitude	No Change in Attitude	Can't Tell	Noticeably Improved Attitude	Greatly Improved Attitude

6. Do you feel that your son's/daughter's motorcycle riding skills:

<u>0%</u>	<u>1%</u>	<u>25%</u>	<u>23%</u>	<u>51%</u>
Have not Changed	Have Improved Slightly	I don't know	Have Improved Moderately	Have Improved Greatly

7. Do you feel that your son's/daughter's knowledge about safe motorcycling:

<u>0%</u>	<u>3%</u>	<u>1%</u>	<u>27%</u>	<u>69%</u>
Has Not Changed	Has Improved Slightly	I don't know	Has Improved Moderately	Has Improved Greatly

\* Based on responses from parents of Round 1 and 2 high school students -- n = 92.

8. How appropriate do you feel it is for a motorcycle rider course to be offered by the Jefferson County School District?

<u>70%</u>	<u>25%</u>	<u>1%</u>	<u>3%</u>	<u>1%</u>
Extremely Appropriate	Somewhat Appropriate	No Opinion	Somewhat Inappropriate	Definitely Inappropriate

If you indicated a feeling other than no opinion, please list several reasons for your response:

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9. Are there any parts of the motorcycle course that you particularly approve or disapprove of? Yes No. If yes, please list the specific parts:

Disapprove:

Approve:

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10. Please indicate your reaction to the following statement: I feel the Motorcycle Rider Course provided an important educational experience for my son/daughter.

<u>2%</u>	<u>2%</u>	<u>1%</u>	<u>30%</u>	<u>65%</u>
Strongly Disagree	Somewhat Disagree	No Opinion	Somewhat Agree	Strongly Agree

11. How satisfied was your son/daughter with the Motorcycle Rider Course?

<u>0%</u>	<u>3%</u>	<u>3%</u>	<u>10%</u>	<u>84%</u>
Very Dissatisfied	Somewhat Dissatisfied	Don't Know	Somewhat Satisfied	Very Satisfied

12. How satisfied are you with the overall course?

<u>0%</u>	<u>0%</u>	<u>4%</u>	<u>42%</u>	<u>54%</u>
Very Dissatisfied	Dissatisfied	No Opinion	Satisfied	Very Satisfied

13. Would you recommend the course for someone else? 97% Yes 3% No

14. Did your son/daughter have an interest in becoming a motorcycle rider BEFORE learning of the Motorcycle Rider Course?        Yes        No        Don't know.  
If Yes, please estimate the level of his/her interest by checking one of the following:

- Prior to the course, he/she had their own motorcycle.
- Prior to the course, he/she had ridden someone else's motorcycle.
- Prior to the course, he/she had not ridden, but had been very interested in riding.
- Prior to the course, he/she had not ridden but seemed somewhat interested in riding.
- Prior to the course, he/she had not ridden and seemed only casually interested in riding.

15. Why did you permit and/or encourage your son/daughter to take the Motorcycle Rider Course? Please list as many reasons as you want:

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16. Please make any further comments regarding the Motorcycle Rider Course and your feelings or impressions of it:

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## SECTION 2

### LICENSURE/RIDING DATA

This section presents data concerning:

1. The rate of licensure for MRC graduates;
2. The number of graduates that are street riding and the extent of this riding;
3. Accident involvement for MRC graduates.

#### Survey of Round 1 & 2 Graduates

The number of MRC graduates that obtain a motorcycle license and the extent to which they ride are two questions that are currently being addressed during the FTMRC. To provide answers to these and other questions, the Jefferson County Driver Education Office, assisted by ASA, mounted an effort to obtain selected data from MRC graduates. This process proceeded as outlined in the subsections below.

#### The Survey Instrument

A survey instrument designed to provide the following information was developed:

- Demographic data
- Licensure data, (new licenses, rationale for not getting a license, etc.)
- Amount of motorcycle riding done monthly
- Motorcycle ownership data
- Accident rate data
- Safety equipment use data

#### Survey Graduates - Wave 1

On 1 June, the survey instrument and a letter (Appendix A) from Dr. Sig Johnson (Jefferson County Driver's Education Director) were mailed to the 200 MRC graduates from Rounds 1 and 2. By 19 June, 83 questionnaires had been returned representing a 41.5% return rate.

## Survey Graduates - Wave 2

Graduates who had not responded by 19 June were mailed a second letter (see Appendix A) and another copy of the questionnaire. By 15 July, 63 additional questionnaires had been returned. This brought the overall return rate up to 73.0%.

## Survey Graduates - Wave 3

A third wave of questionnaires was mailed to non-responding students early in August. (A copy of the cover letter used for Wave 3 is provided in Appendix A.) As of 5 September, 11 additional questionnaires had been returned.

Therefore, to date, 157 of the 200 Round 1 and 2 graduates have completed and returned their questionnaire. This represents an overall response rate of 78.5%.

## Overall Results of Survey

The overall results of the survey of Round 1 and 2 graduates are as follows:

1. 78.5% (157/200) of the graduates completed and returned their questionnaire.
2. 14.0% (22/157) of the respondents had a license at the start of the course.
3. 29.6% (40/135) of the previously nonlicensed respondents obtained a license within 6 months after graduating from this course.
4. 39.5% (22 + 40/157) of the respondents currently have a license.
5. 79.0% (49/62) of the licensed respondents have ridden on the street during the six months since graduating.
6. 21.1% (20/95) of the nonlicensed respondents have ridden on the street during the last six months (on their 90 day permit obtained during the MRC and/or illegally).
7. 43.5% (49 + 20/157) of the respondents are street riding.
8. 10.1% (7/69) of the respondents who are street riding had an accident within 6 months after graduating.

The licensure rate indicated in Number 4 above (39.5%) is a matter of some concern. Clearly, cost effective conduct of the demo will require that a substantially higher percentage of MRC graduates obtain a license.

As discussed below, through additional analyses of the data, we have determined that the overall data in general, and the rate of license in particular, are not representative of what could be obtained during future conduct of the MRC in a setting similar to the FTMRC.

Survey Results by Subgroup

In order to gain a further understanding of the survey data, analyses of these data by the following subgroups were conducted:

- High School Females
- High School Males
- Adult Females
- Adult Males

Table 2-1 presents enrollment and survey response data for each of these subgroups.

Table 2-1  
Round 1 and 2 Enrollment and Survey Data  
by Sex/Age group

<u>Subgroup</u>	<u>Completed</u> <u>Round 1 or 2</u>		<u>Returned Survey</u>	
		<u>Col</u>		<u>Col</u>
	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>
High School Females	34	17.7	30	19.1
High School Males	89	46.3	71	45.2
Adult Females	35	18.2	31	19.7
Adult Males	<u>34</u>	<u>17.7</u>	<u>25</u>	<u>15.9</u>
	192*	100.0	157	100.0

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\* Does not include 8 students for whom certain demographic data is missing.

The following points should be noted:

- Approximately 17% of the Round 1 and Round 2 graduates were high school females.
- High school females are slightly overrepresented in the survey results.

The importance of these data will become clear in the discussion that follows:

Table 2-2 presents licensure data for each of the four subgroups.

Summarizing the data presented in Table 2-2 indicates the following licensure rates for each subgroup:

<u>Subgroup</u>	<u>Number in Survey</u>	<u>Number Licensed</u>	<u>% of Subgroup Licensed</u>
High School Males	71	29	40.8
High School Females	30	1	3.3
Adult Males	25	16	64.0
Adult Females	31	16	51.6

} 57.1%

Of the data presented thus far in this memo, the above information probably has the greatest bearing on demo planning. The implications of these data are rather clear:

- Adults recruited from the community at large had a licensure rate (57.1%) that, with some improvement, would be acceptable for the demo project. This is particularly true of adult males with a rate of 64.0.
- The rate for high school males (40.8), while somewhat low, could be improved by selective enrollment procedures.
- Unless prequalified (e.g., already have license or have access to motorcycle and definitely plan to get license) high school females will be a very poor risk for the demo.

The above information suggests the need for prescreening of demo project applicants. This subject is discussed later in this memo.

At this point, it should be noted that during the FTMRC, no attempt was made to select applicants on the basis of licensure considerations. The course was advertised as being for novice riders and, if anything, already licensed persons may have been discouraged from taking the course. Also, the fact that certain MRC instructors assisted in the recruitment

Table 2-2

Licensure Data by Subgroup

Cells Contain:

Number of Subjects  
 % of Col. Total  
 % of Row Total  
 % of Grand Total

Motorcycle License Status	Subjects				Row Total
	High School Males	High School Females	Adult Males	Adult Females	
Not Licensed	42	29	9	15	95
	59.2	96.7	36.0	48.4	60.5
	44.2	30.5	9.5	15.8	100.0
	26.8	18.5	5.7	9.6	60.5
Previously Licensed*	10	0	8	4	22
	14.1	0.0	32.0	12.9	14.0
	45.5	0.0	36.4	18.2	100.0
	6.4	0.0	5.1	2.5	14.0
Newly Licensed**	19	1	8	12	40
	26.8	3.3	32.0	38.7	25.5
	47.5	2.5	20.0	30.0	100.0
	12.1	0.6	5.1	7.6	25.5
Col. Total	71	30	25	31	157
	100.0	100.0	100.0	100.0	100.0
	45.2	19.1	15.9	19.7	100.0
	45.2	19.1	15.9	19.7	100.0

\* Had license prior to taking MRC.

\*\* Received license within 6 months after completing MRC.

of high school students may have biased, to some extent, the sample of high school students. Specifically, we know that certain instructors actively recruited high school females for their sections of the course. Fortunately, this "personal" approach to recruitment was largely curtailed by ASA following Round 1. (Given late award of the contract, we more or less permitted instructors a free hand in recruiting students for Round 1.)

The biasing effect of this procedure, regarding high school females, is evident in Table 2-3. Specifically, in terms of course graduates, these data reveal the following representation for high school females:

Round 1: 22.9%

Round 2: 10.8%

Round 3: 8.1%

Round 4: 0.0%

High school females are clearly overrepresented in Round 1, and this effect is largely a function of the recruiting methods described above.

This factor causes two problems for the present analysis of licensure/riding data:

1. High school females are overrepresented in our data since the questionnaire survey of students has, to date, only involved Round 1 and Round 2 students.
2. They responded to the survey at a somewhat higher rate than males. That is, as illustrated in Table 2-1, high school females comprised 17.7% of the Round 1 and 2 graduates, yet accounted for 19.1% of the survey returns.

Based on the reasons outlined above, and the fact that they had a licensure rate of 3.3%, we have performed a second analysis of licensure/riding data that excludes high school females.

Table 2-4 presents riding and accident data by license status and subgroup (excluding high school females).

#### Riding Data

Within each license status group, the following proportion of subjects have been street riding since graduating from the MRC.

<u>License Status</u>	<u>% Street Riding</u>
Non-licensed	24.2%
Previously licensed	81.8%
Newly licensed	79.5%

Table 2-3  
Enrollment Data  
by Round and by Subgroup

<u>Round/Subgroup</u>	<u>Started Course</u>		<u>Completed Course</u>		
	<u>n</u>	<u>Col %</u>	<u>n</u>	<u>Col %</u>	<u>% Comp</u>
<b>Round 1</b>					
Male Students	77	49.7	59	54.1	76.6
Female Students	42	27.1	25	22.9	59.5
Male Adults	18	11.6	12	11.0	66.7
Female Adults	<u>18</u>	<u>11.6</u>	<u>13</u>	<u>11.9</u>	<u>72.2</u>
	155	100.0	109	100.0	70.3
<b>Round 2</b>					
Male Students	43	33.6	30	36.1	69.8
Female Students	15	11.7	9	10.8	60.0
Male Adults	35	27.3	22	26.5	62.9
Female Adults	<u>35</u>	<u>27.3</u>	<u>22</u>	<u>26.5</u>	<u>62.9</u>
	128	100.0	83	100.0	64.8
<b>Round 3</b>					
Male Students	42	39.2	29	39.2	69.0
Female Students	6	5.6	6	8.1	100.0
Male Adults	28	26.2	23	31.1	82.1
Female Adults	<u>31</u>	<u>29.0</u>	<u>16</u>	<u>21.6</u>	<u>51.6</u>
	107	100.0	74	100.0	69.2
<b>Round 4</b>					
Male Students	12	11.8	7	9.9	58.3
Female Students	1	1.0	0	0	0.0
Male Adults	40	39.2	30	42.2	75.0
Female Adults	<u>49</u>	<u>48.0</u>	<u>34</u>	<u>47.9</u>	<u>69.4</u>
	102	100.0	71	100.0	69.6
<b>Round 1-4 Summary</b>					
Male Students	174	35.4	125	37.1	71.8
Female Students	64	13.0	40	11.9	62.5
Male Adults	121	24.6	87	25.8	71.9
Female Adults	<u>133</u>	<u>27.0</u>	<u>85</u>	<u>25.2</u>	<u>64.9</u>
	492	100.0	337	100.0	68.5

Table 2-4

Riding Data and Accident Data  
by License Status for each Subgroup (excluding H.S. Females)

<u>License Status Subgroups</u>	<u>Number in Survey</u>	<u>Number Street Riding</u>	<u>% Street Riding</u>	<u>Miles Ridden Per Month</u>	<u>Number of Accidents</u>	<u>Accident Rate</u>
<b>Non-Licensed</b>						
H.S. Males	42	10	23.8	1-50	-	-
Adult Males	9	2	22.2	1-25	-	-
Adult Females	<u>15</u>	<u>6</u>	<u>40.0</u>	<u>1-50</u>	<u>1</u>	<u>.167</u>
Total	66	18	27.3	1-50	1	.056
<b>Previously Licensed</b>						
H.S. Males	10	8	80.0	151-200	1	.125
Adult Males	8	7	87.5	201-250	2	.286
Adult Females	<u>4</u>	<u>3</u>	<u>75.0</u>	<u>101-150</u>	<u>1</u>	<u>.333</u>
Total	22	18	81.8	151-200	4	.222
<b>Newly Licensed</b>						
H.S. Males	19	17	89.5	51-100	-	-
Adult Males	8	7	87.5	51-100	2	.286
Adult Females	<u>12</u>	<u>7</u>	<u>58.3</u>	<u>1-50</u>	<u>-</u>	<u>-</u>
Total	39	31	79.5	51-100	2	.064
<b>Licensed (New &amp; Previous)</b>						
H.S. Males	29	25	86.2	51-100	1	.040
Adult Males	16	14	87.5	151-200	4	.286
Adult Females	<u>16</u>	<u>10</u>	<u>62.5</u>	<u>25-50</u>	<u>1</u>	<u>.100</u>
Total	61	49	80.3	101-150	6	.122

While some of the non-licensed subjects may be riding illegally, it should be noted that all students did receive a temporary permit in order to participate in the street riding sessions of the MRC. This permit lasts for 90 days, so it is possible that certain of these students rode prior to expiration of the permit.

While the overall proportion of previously licensed and newly licensed students that are riding is approximately the same, the lower rate of ridership for newly licensed adult females (58.3%) is noteworthy.

In terms of the amount of riding done by each category of riders, we find the following:

<u>License Status</u>	<u>Average Monthly Mileage</u>
Non-licensed	1-50
Previously Licensed	151-200
Newly licensed	51-100

It is important to note that the previously licensed riders are logging over twice as many miles as the newly licensed riders. This is likely a function of higher ownership of motorcycles by previously licensed riders, and perhaps more established riding habits. In any event, these data suggest that previously licensed novice riders are a desirable subgroup for purposes of the demo. While the non-licensed riders could, in theory, be included in the demo, we have not included them in the analyses discussed below. Their current level of riding is quite low and, in time, certain of them will likely become licensed and would then be included in the study group.

Summarizing the data by licensed subgroups, we find the following levels of ridership:

<u>Licensed Subgroups</u>	<u>% Street Riding</u>
High School Males	86.2
Adult Males	87.5
Adult Females	<u>62.5</u>
Overall	80.3

While an overall ridership rate of approximately 80% is reasonably high, we believe that during the demo project this rate could easily be increased to 85-90% by prescreening applicants.

The amount of riding done by each licensed subgroup can be summarized as follows:

<u>Licensed Subgroup</u>	<u>Average Monthly Mileage</u>
High School Males	51-100
Adult Males	151-200
Adult Females	<u>25-50</u>
Overall	101-150

Adult males stand out as the group with the highest level of riding. Across the three subgroups, these data suggest that MRC graduates (excluding H.S. females) can be expected to log, on the average, 1200-1800 miles during the first year following graduation. Furthermore, we believe this to be a conservative estimate since:

1. The time frame sampled by our questionnaire covered the months of November through May for Round 1 graduates and December through May for Round 2 graduates. Three of these months (Dec., Jan., Feb.) have reasonable cold spells, and the remaining three (March, April, May) represent months during which we receive reasonable precipitation (relative to the rest of the year).
2. Not all riders received their license immediately after the course. Thus, although the survey covered 6 or 7 months, certain respondents were riding only during the last 2 or 3 months.
3. The months of June through October have traditionally been the warmest and driest months in Denver. Therefore, during these months we would estimate a considerably higher level of riding.

With respect to Point 2 above, it should be noted that, in calculating the average monthly mileage figures, we took into account all months covered by the survey. Thus, if a Round 1 graduate rode 200 miles in March, April and May (total of 600 miles), this total would be divided by 7 months ( $300/7 = 85$ ) and his average monthly mileage expressed as 51-100.

#### Accident Data

Summarizing the accident data by licensed subgroup, reveals the following:

<u>Licensed Subgroup</u>	<u>Number Riding</u>	<u>Number of Accidents</u>	<u>Accident Rate*</u>
High School Males	25	1	.04
Adult Males	14	4	.29
Adult Females	<u>10</u>	<u>1</u>	<u>.10</u>
Overall	49	6	.12

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\*  $\frac{\text{Number of Accidents}}{\text{Number Riding}} = \text{Accident Rate}$

Adult males stand out as the group with the largest number of accidents. While this is likely related to their higher level of riding, we will need to collect data on many more accidents before any conclusions can be made.

On a yearly basis, these accident data suggest that the self-reported accident rate might be .24 (2 X .12). However, since the survey did not cover the prime riding months in Denver (particularly June-August), we estimate that the actual accident rate for the first year following graduation would be closer to .30.

## SECTION 3

### PRELIMINARY EVALUATION PLAN FOR DEMO PROJECT

Building upon the relevant data collected thus far during the FTMRC, and input from Dr. John Hawley (Statistical Consultant), this section will provide an outline of a preliminary evaluation plan for the demo.

Information is presented in terms of the following subsections:

1. Statistical requirements.
2. Basic assumptions concerning subject populations and study conduct.
3. Sample size requirements.

#### Statistical Requirements

Tables 3-1 and 3-2 illustrate the sample size required for the experimental and control group as a function of:

1. Crash rate over two years - values from .06 through .30 have been selected as a representative range.
2. True effect of training on accident reduction - values of 10%, 15% and 20% have been selected.

The tables are identical except that in Table 3-1 power is set at .50 and in Table 3-2 power = .75. It is noted that raising power from .50 to .75 basically doubles the sample size required. In this respect, ASA would like to note that the discussion of power in the Demonstration Project Handbook (p. XVI-12) is somewhat incomplete. Specifically, the handbook does not explicate the influence of raising power on a given alpha level. For the example given in Table 3-1 ( $\alpha = .05$ , power = .50), the effect of raising power to .75 (Table 3-2) is to decrease alpha to the neighborhood of .01 (one-tailed). Also, most treatments of sample size (e.g., Cochran, W.G., Sampling Techniques, Wiley, 1963; Demig, W.E., Sample Design in Business Research, Wiley, 1960), omit discussion of power; those that do discuss sample size and power (e.g., Mason, R.G., Statistical Techniques in Business and Economics, V.4, R.D. Irvin & Co., 1977), do so for a range of true alternatives in the form of an Operating Characteristic Curve (OCC) of Power Function.

Table 3-1

Sample Size Required\* for Each Group (exp. & control) as a Function of the Effect of Training on Accident Reduction (True Effect) and Crash Rate for the Control Group. With:

- $\alpha = .05$ , one tailed
- $\beta = .50$ , (Power = .50)

	Two Year Crash Rate						
True Effect	.06	.08	.10	.15	.20	.25	.30
10%	8531	6262	4901	3086	2178	1634	1271
15%	3791	2783	2178	1371	968	726	565
20%	2133	1565	1225	771	545	408	318

\*Based upon the following formula for determining sample size.

$$N = \frac{2Z^2PQ}{d^2}$$

.Z = the tabled value of the standard normal distribution for a given alpha level.

.P = the probability of an accident.

.Q = 1-P

.d = the expected difference between the experimental and control groups.

Table 3-2

Sample Size Required for Each Group (exp. & control)  
as a Function of the Effect of Training on Accident  
Reduction (True Effect) and Crash Rate for the Control  
Group. With:

- $\alpha = .05$ , one tailed\*
- $\beta = .25$ , (Power = .75)

	Two Year Crash Rate						
True Effect	.06	.08	.10	.15	.20	.25	.30
10%	17,011	12,486	9772	6153	4343	3257	2533
15%	7560	5550	4343	2735	1930	1448	1126
20%	4253	3122	2443	1538	1086	814	633

\* By increasing power to .75, alpha will in fact be in the neighborhood of .01.

In any event, it is ASA's judgment that if meaningful treatment effects do in fact exist, they can be detected using tests with  $\alpha = .05$  and power = .50. We do not believe that the doubling of sample sizes required by setting power = .75 is necessary. On the other hand, we do recognize that sample sizes must be inflated to control for various sources of attrition. This matter is discussed later in this section.

As a final point, it should be noted that the formula for sample size given in the handbook (p. XVI-6) uses student's  $t$  in the calculations. This is appropriate for sample sizes up to 60. For sample sizes over 60 (which would be the case in most demo projects), the tabled values of the standard normal distribution,  $Z$ , are the correct choice (Cochran op cit).

### Basic Assumptions Concerning Subject Populations and Study Conduct

The purposes of this subsection are to:

1. Provide realistic estimates for all sources of sample attrition.
2. Specify an approach to accident data collection.

Determination of these factors, coupled with the statistical requirements discussed earlier, will permit accurate estimation of required sample sizes.

### Estimates for Sources of Sample Attrition

The following sources of sample attrition (for the experimental group) and their associated rates must be estimated:

1. Completion Rate - number of students who successfully complete the training course (i.e., "graduate").
2. Licensure Rate - number of course graduates that obtain a license after completion of the course.
3. Ridership Rate - number of licensed graduates that street ride on a regular basis.
4. Drop-out Rate - number of subjects (i.e., graduates who obtain a license and street ride) who drop out of the study for one reason or another (e.g., move to a different city, stop riding, die, etc.).
5. Accident Rate - number of accidents experienced by the population of subjects.

For the control group, estimates for Items 2-5 above must also be developed.

These estimates are provided below.

Completion Rate. The completion rate for the FTMRC is currently 68.5%. For the demo, it is likely that courses tailored to the entering behavior of students will be utilized (e.g., 3 hour course for individuals with moderate riding experience; 10 hour course for students who can pass the Range Skill Test (RST) on the first day of class; 23 hour course for novice riders that cannot pass RST on first day of course). If this is done, we estimate that the completion rate would be at least 70% and could be 75-80%. In any event, for our current planning, 70% will be used.

Licensure Rate. For the FTMRC, the licensure rate ranged from 40.8% for high school males to 64.0% for adult males (excluding high school females). Applicants for the demo must be screened in terms of the following factors:

- Plans for obtaining a license.
- Availability of a motorcycle.
- Plans for riding.

Through selective recruitment (which would include motor vehicle department license applicants) and effective screening, we believe that the licensure rate for course graduates can easily be increased to 75%. Thus, we will use 75% in the calculations made later in this section.

As currently envisioned, the screening process described above would occur prior to the formation of experimental and control groups. After screening, the pool of remaining applicants would be randomly distributed into control and experimental groups. This being the case, the licensure rate (and riding rate) for the control group should be close to that of the experimental group. However, since the control group will not receive training, and assuming that training may increase the licensure rate for certain students in the experimental group, we estimate that fewer control group subjects will be licensed. For present purposes, the rate of licensure for the control group has been estimated at 60%.

Ridership Rate. For the FTMRC we found that approximately 80% of the licensed graduates were street riding on a fairly regular basis. While prescreening of demo applicants might increase this rate somewhat, for now, we have assumed the rate to be 80% for the experimental group. In theory, the ridership rate for the control group should be close to that of the experimental group. However, since training may increase ridership somewhat, (e.g., "now that I've been taught how to ride I should put my education to use"), we have estimated the rate of ridership for the control group at only 70%.

Drop-out Rate. Once subjects for each group have been selected and processed, it is reasonable to expect that a certain proportion will drop

out of the study. For example, they might move out of the study area, they may stop riding, etc. We have been unable to obtain data upon which to base an estimate of this source of attrition. In the absence of such data, we have arbitrarily assumed that in both the experimental and control groups, 15% of the subjects will drop out of the study during the first year and another 15% during the second year (30% over two years).

#### Accident Rate Estimates

In estimating accident rate, the following data have been considered:

1. The officially reported 12 month rate from the California demo is .0488.
2. The self-reported rate for California is .50 for the 1st year.
3. The self-reported rate for the FTMRC is .30 for the first year following training.

Given this information, the following estimates have been made:

1. The officially reported 12 month rate for novices across the country will be approximately .040. (The California rate has been deflated to take into account the shorter riding seasons that prevail in many parts of the country.)
2. The officially reported 24 month rate will be approximately .060 (.040 the first year and .020 the second). The second year rate has been reduced to reflect the "fact" that "most accidents occur during the first year of riding".
3. The self-reported rate during the first year will be .30 (based upon FTMRC data) and during the second year .15. Thus, the two year self-reported rate would be approximately .45.
4. All officially reported accidents can be captured. This will provide a rate of .06 over two years.
5. Approximately 30% of the self-reported accidents can be reliably captured through proper survey methods (recall that 78.5% of the MRC graduates responded to the survey conducted by the Jefferson County Driver Education office). Thus, the captured self-reported rate will be approximately .14.
6. A combination of 4 and 5 above will provide a captured accident rate of .20 (.06 + .14) over two years.

#### Sample Attrition and Accident Rate Summary

Summarizing the above information for the control and experimental groups provides the following estimates (assuming a two year period of tracking following training):

	<u>Exp. Group</u>	<u>Control Group</u>
Course Completion Rate	70%	-
Licensure Rate	75%	60%
Ridership Rate	80%	70%
Drop-out Rate	30%	30%
Captured Accident Rate	.16-.18*	.20

\* Assuming true effect of 10-20%

### Sample Size Requirements

Given the assumptions described above, we currently recommend the use of 4000 trainees and 4000 controls for a project that would track subjects for two years (4000 students would be trained over a two year period and each student tracked for two years).

The basis for these sample sizes is outlined below.

#### Experimental Group

1. 4000 subjects are enrolled in training program.
2. 70% of these students will graduate.  
2800 subjects graduate.
3. 75% of these will obtain a license.  
2100 subjects licensed.
4. 80% of those licensed will ride on the street.  
1680 subjects street riding.
5. 70% of those riding will remain in study (30% drop-out).  
1176 subjects in study.

#### Control Group

1. 4000 subjects are placed in control group.
2. 60% of these subjects will obtain a license.  
2400 subjects licensed.

3. 70% of those licensed will ride.  
1680 subjects street riding.
4. 70% of those riding will remain in study (30% drop-out).  
1176 subjects in study.

### Summary

With 1176 subjects in each group, examination of Tables 3-1 and 3-2, (pp. 3-2 and 3-3) reveals that:

1. With power = .50, a true effect of 15% could be detected (i.e., 968 subjects are required).
2. With power = .75, a true effect of 20% could be detected (i.e., 1086 subjects are required).

### Comments

Accounting for the sources of attrition described earlier resulted in our initial pool of 4000 subjects being reduced to an actual study sample of 1176. This is approximately a 70% reduction. Another way of looking at this figure is that 4000 is approximately 3.4 times 1176.

With this value in mind, the reader may wish to refer back to Table 3-2 and consider the following:

- The memo from Mr. Voas assumes: a captured accident rate of .10, power = .75, and detection of a true effect of 15%. With these assumptions, approximately 14,766 subjects (3.4 X 4343) would be required for each group.
- For reasons discussed earlier, we believe that the two year "officially reported" accident rate of .10 (Voas memo) is too high. Our estimate is .06. Substituting .06 for .10, with power = .75, and detection of a 15% decrease in accidents, results in an initial sample of approximately 25,704 (3.4 X 7560).

The above sample sizes are three to five times higher than the 5000 mentioned in the Voas memo, and would require the allocation of 1.5 to 2.5 million dollars just for the training of subjects (assuming a training cost of \$100/subject, which is the low end of the per student cost scale)\*.

These costs appear to be beyond the scope of the demo as we now understand it. Therefore, we believe that self-reported accident data must be used to supplement that obtained from official sources.

Upon request, ASA will provide a description of how such a self-report system might work.

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\* Detailed cost estimates (per student) for the types of course configurations described earlier will be provided in a memo to be submitted o/a 13 September 1978.

**APPENDIX A**

**Materials Used for Survey**

**of**

**Round 1 and 2 Graduates**



# JEFFERSON COUNTY PUBLIC SCHOOLS

13300 W. ELLSWORTH AVE. GOLDEN, COLORADO 80401

981-1035

ADULT EDUCATION DEPARTMENT

Dear Motorcycle Rider Course Graduate:

I am writing to ask you to complete a follow-up questionnaire related to the Motorcycle Rider Course you successfully completed last fall.

As you may already know, last fall was the first time that the Jefferson County Schools offered motorcycle training on a large scale basis. Given the new nature of the program, it is important that we make every attempt to assess the educational outcomes of offering this course. Without such information, it is unlikely that we can provide justification for offering the course in the future.

Accordingly, I have enclosed a questionnaire that requests various information related to your motorcycling experience. Please take a few minutes to fill out the questionnaire and return it in the stamped self-addressed envelope. Please be assured that all information will be treated as confidential, and that summaries of the data collected will not reveal the student's names.

By providing complete and honest answers to these questions, you will be helping to further the cause of motorcycle safety in the Denver area.

Thank you for participating in this survey. If you have any questions regarding the questionnaire, please do not hesitate to contact me. Please return your questionnaire no later than 12 June.

Sincerely,

Dr. Sig Johnson  
Director of Driver Education and  
Adult Education

SJ:sw

P.S. I have also enclosed two safety decals from the Motorcycle Safety Foundation. We thought you might find these of value.

Motorcycle Rider Course  
Confidential Survey of Course Graduates

Please provide complete and honest answers to the following questions and return the questionnaire in the enclosed envelope as soon as possible.

Thank you!

Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_ Phone No. \_\_\_\_\_

Birthdate \_\_\_\_\_ Sex: \_\_\_\_\_  
Male Female

High School Attended \_\_\_\_\_

Driver's License: State \_\_\_\_\_ Operator # \_\_\_\_\_

1. Did you have a motorcycle endorsement on your driver's license before taking the Motorcycle Rider Course?

\_\_\_\_\_ Yes (Go to question 4)

\_\_\_\_\_ No (Go to question 2)

2. Have you obtained a regular motorcycle license since graduating from the Motorcycle Rider Course?

\_\_\_\_\_ Yes If yes, in what month did you take your on-cycle licensing test: Month \_\_\_\_\_ (Go to question 4)

\_\_\_\_\_ No (Go to question 3)

3. If you have not obtained a motorcycle driver's license, we would like to get some idea of when you will and/or why you haven't. Please check all the reasons below that apply to you.

\_\_\_\_\_ I seriously plan to take the on-cycle licensing test within the next \_\_\_\_\_ months.  
(fill in no.)

\_\_\_\_\_ A motorcycle has not been available for me to take the test on; otherwise, I would have obtained my license.

(Reasons cont'd on next page.)

I am not interested in getting a license to ride on the street at this time.

       I would like to get a license, but my parents will not permit me to do so at this time.

       I attempted to get a license but failed the motorcycle riding test.

Other Reasons \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. Have you done any motorcycle riding (as the driver) since graduating from the Motorcycle Rider Course?

       Yes (Go to question 5)

       No (You have completed the questionnaire)

5. We would like to get an idea of how much riding (as the driver) you have done since completing the Motorcycle Rider Course. In the space below, please estimate by month the number of miles you have ridden (street/trail). A good way to estimate past miles ridden is to think about the number of hours you typically rode on a weekly basis, and your average speed. Multiply the hours by the speed and then multiply this number by 4.5 (weeks) to get a monthly estimate of miles ridden. Example: 10 hrs. per week at an average speed of 35 = 10 hrs. X 35 mph = 350 miles. 350 miles X 4.5 weeks per month = 1,575 miles.

Please complete all blanks. For months in which you did not ride, use "0's" to designate no miles. Do not include time spent riding during the Motorcycle Rider Course in these estimates.

<u>Month</u>	<u>Est. of total street Riding Miles</u>	<u>Est. of total trail Riding Miles</u>
Nov. 1977	_____	_____
Dec. 1977	_____	_____
Jan. 1978	_____	_____
Feb. 1978	_____	_____
Mar. 1978	_____	_____
Apr. 1978	_____	_____
May 1978	_____	_____

6. Did you own a motorcycle before taking the Motorcycle Rider Course?

\_\_\_\_\_ Yes If yes, please describe type of machine:

Make \_\_\_\_\_ Size in cc \_\_\_\_\_

\_\_\_\_\_ No

7. Have you purchased a motorcycle since taking the Motorcycle Rider Course?

\_\_\_\_\_ Yes If yes, please describe type of machine.

Make \_\_\_\_\_ Size in cc \_\_\_\_\_

\_\_\_\_\_ No, but have one available to ride. Please describe whose bike(s) you are riding \_\_\_\_\_

\_\_\_\_\_ No, but plan to within the next \_\_\_\_\_ months.  
(fill in no.)

\_\_\_\_\_ No, and don't plan to within the foreseeable future.

8. Unfortunately, motorcycle accidents or mishaps are not uncommon. Hopefully, you have not had any. If you have, it is very important that we learn something about them. (Let me re-emphasize that the information you provide will be treated as strictly confidential. It will be used solely for purposes of improving the Motorcycle Rider Course.) We are interested in any motorcycle "accident" in which one or more of the following occurred:

1. You struck an object. For example, you ran into any of the following: car, pedestrian, fence, pole, etc.
2. You skidded or slid and dropped your motorcycle. For example, to avoid hitting a car you locked the rear brake, slid out and went down.
3. You lost control of the motorcycle and unintentionally left the roadway. For example, you slid on gravel and went over the shoulder of the roadway.

Since completing the Motorcycle Rider Course, have you had any accidents (as defined above)? \_\_\_\_\_ Yes \_\_\_\_\_ No (Go to question 9)  
If yes, how many \_\_\_\_\_.

For each accident, please fill in the information requested below (consider your most recent accident as #1, next most recent #2, etc.):

	Accident 1	Accident 2	Accident 3	Accident 4
MONTH (fill in box) . . . . .	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
TYPE OF ACCIDENT . . . . . (Place appropriate Item Number in box)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1. Collided with another vehicle (car, van, truck)				
2. Collided with fixed object (tree, pole)				
3. Collided with pedestrian				
4. Skidded/slid out and dropped cycle (no other vehicle involved, no ob- ject struck)				
5. Left roadway (e.g., went over embankment - no other vehicle involved, no ob- ject struck)				
TYPE OF ROAD . . . . . (On which accident occurred)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1. Paved public road				
2. Unpaved public road				
3. Off public road (e.g., trail or dirt riding)				
PERSONAL INJURY . . . . . (Consider only yourself)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1. None				
2. Minor (cuts, bruises)				
3. Serious (broken bones, cuts requiring stitches)				
4. Severe (ambulance took me from scene)				
PROPERTY DAMAGE . . . . . (To your cycle)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
1. None				
2. Minor (dents and scratches costing up to \$50 to repair)				
3. Some serious damage (cost \$50-\$250)				
4. Severe damage (cost over \$250)				

9. Since completing the Motorcycle Rider Course, how many "near misses" (almost a motorcycle accident as defined above) have you experienced?

Total number of near misses: \_\_\_\_\_

10. Please break down your total number of near misses into the following location

\_\_\_\_\_ On public roads (paved and unpaved)

\_\_\_\_\_ Off public roads (e.g., trail/dirt)

11. Percent of time you wear a safety helmet when riding?

\_\_\_\_\_ Never wear one

\_\_\_\_\_ Approximately 25% of the time

\_\_\_\_\_ Approximately 50% of the time

\_\_\_\_\_ Approximately 75% of the time

\_\_\_\_\_ Always wear one

12. Percent of time you wear high visibility clothing when riding?

\_\_\_\_\_ Never wear it

\_\_\_\_\_ Approximately 25% of the time

\_\_\_\_\_ Approximately 50% of the time

\_\_\_\_\_ Approximately 75% of the time

\_\_\_\_\_ Always wear it

13. Percent of time you ride with your headlight on during the daytime?

\_\_\_\_\_ Never

\_\_\_\_\_ Approximately 25% of the time

\_\_\_\_\_ Approximately 50% of the time

\_\_\_\_\_ Approximately 75% of the time

\_\_\_\_\_ Always



# JEFFERSON COUNTY PUBLIC SCHOOLS

13300 W. ELLSWORTH AVE. GOLDEN, COLORADO 80401

988-1035

ADULT EDUCATION DEPARTMENT

Dear Motorcycle Rider Course Graduate:

I recently sent you a questionnaire asking the extent and nature of your motorcycling activity since you successfully completed the Motorcycle Rider Course. To date, we have not received your completed questionnaire. As I explained earlier, it is of critical importance to determine the impact the course has on graduates. You are in the unique position of providing this valuable information.

For your convenience I have enclosed another copy of the questionnaire. Even if you do not currently ride a motorcycle, there are a few questions we would like you to complete. The information you furnish to us is absolutely confidential and will be used only for research and development purposes.

Please take a few minutes to complete the questionnaire and return it in the enclosed self-addressed stamped envelope. A timely reply will be greatly appreciated.

Sincerely,

Dr. Sig Johnson *sw*  
Director of Driver Education and  
Adult Education

Contract No. DOT-HS-7-01635  
Field Test of a Motorcycle Safety Education  
Course for Novice Riders

PROJECT MEMO: COST ESTIMATES FOR TRAINING ASPECT  
OF MOTORCYCLE DEMONSTRATION PROJECT

Prepared by:

Richard M. Thackray, Jr.  
Project Director

Prepared for:

Department of Transportation  
National Highway Traffic Safety Administration  
Room 3112, Transpoint Building  
Washington, D.C. 20590

12 October 1978

COST ESTIMATES FOR TRAINING ASPECT  
OF MOTORCYCLE DEMONSTRATION PROJECT

Introduction

On 8 September 1978, ASA submitted a project memo that addressed sample size requirements for the demo project. Specifically, we recommended the use of 4,000 trainees and 4,000 controls for a project that would track subjects for two years (4,000 students would be trained over a two year period and each student tracked for two years).

Based on discussions with Mr. Herb Miller, we currently recommend that the number of subjects in each group be increased from 4,000 to 5,000. This increase will serve to cover possible sources of sample attrition which may not have been accounted for in the above referenced memo.

Candidate Training Program

At this time, various approaches to training program design are being considered by NHTSA. In order to permit development of initial cost estimates, we have used a design that could be implemented in the Denver area. While this may not be the actual design employed for the demo, it has the advantage of being based on our experience to date with the Field Test of a Motorcycle Rider Course (FTMRC) in Denver.

The basic aspects of this candidate program are as follows:

1. During each of the two years of training, seven rounds consisting of 30 course sections, with 12 students in each section, would be offered over a 42 week period.
2. Training would be conducted from 1 March through 15 December. This schedule would thus avoid the weeks of the year when snow and cold weather sometimes occur in Denver.
3. According to this plan, 2,520 students would be enrolled in the course each year:
  - 30 sections x 12 students in each = 360 students/round
  - 360 students x 7 rounds = 2,520

4. Each year, approximately 1,764 students can be expected to graduate from the course. (70% completion rate x 2,520 = 1,764.) This would provide a total of 3,528 graduates over two years.
5. Four riding ranges would be employed. Thus, at any one time during the day, a maximum of four sections of the course would be in session (a total of 48 students).
6. Based on the above considerations, and our experience with the FTMRC, the following personnel and equipment would be required.
  - 16-20 teachers
  - A course administrator who would devote approximately 50% of his/her time to the program. (The other half of this person's time might be spent as a course instructor.)
  - A secretary who would devote approximately 25% of his/her time to the program
  - A head mechanic/course aide who would devote 100% of his/her time to the program
  - An assistant mechanic/course aide who would devote 40% of his/her time to the program
  - 60 motorcycles, 60 helmets, 60 riding vests, etc.
  - 9 Motorola transceivers (this would provide 1 spare)
  - 56 Motorola mini-monitors (this would provide 8 spares)

#### Start-Up costs

Start-up costs\* for the training program are detailed in Table 1 in terms of the following categories:

1. Services (e.g., range preparation).
2. Reusable Materials (e.g., safety vests, helmets).
3. Motorola Communication Gear.
4. Instructor Preparation.

---

\*These cost estimates, and the others presented in this memo, are based upon experience gained with similar costs elements during conduct of the FTMRC.

TABLE 1

## START-UP COSTS

SERVICES (includes labor & materials)

Construct shelter for 60 motorcycles	\$5,000.00
Paint four ranges	<u>600.00</u>
Total	\$5,600.00

REUSABLE MATERIALS

<u>Item</u>	<u>Quantity</u>	<u>Cost</u>	<u>Total</u>
Safety Vests	60	\$ 7.00	\$ 420.00
Lettering of Vests	60	2.50	150.00
Helmets	60	21.00	1,260.00
Face Shields	60	1.75	105.00
Tool Box & Tools	1	125.00	125.00
Battery Chargers	10	15.00	150.00
Fire Extinguishers	4	17.50	70.00
6" Traffic Cones	400	1.10	440.00
Stop Watches	12	20.00	240.00
MRC Course Package	8	400.00	3,200.00
Course Transparancies	8 sets	100.00	<u>800.00</u>
Total			\$ 6,960.00

COMMUNICATION GEAR (Motorola)\*

<u>Item</u>	<u>Quantity</u>	<u>Cost</u>	<u>Total</u>
Transceivers	9**	\$1,075.00	\$ 9,675.00
Chargers	8	55.00	440.00
Mini Monitors	56***	243.00	13,608.00
Lapel Speakers	56***	27.00	1,512.00
Master Chargers	4	150.00	600.00
Auxiliary Chargers	4	125.00	500.00
Head Sets	8	160.00	1,280.00
Adapter Kits	8	26.00	208.00
Push-to-talk Switches	8	35.00	280.00
Installation	--	900.00	900.00
Coordination Fee	--	--	10.00
FCC License	--	--	<u>10.00</u>
Total			\$29,023.00
Taxes (5%)			<u>1,451.00</u>
Total			\$30,474.00

INSTRUCTOR PREPARATION

<u>Person</u>	<u>Hours</u>	<u>Rate</u>	<u>Cost</u>
Teachers (20)	1600	10.0	<u>\$16,000</u>
		Total	\$16,000

Summary of Start-Up Costs

Services . . . . .	\$ 5,600.00
Materials . . . . .	6,960.00
Communication Gear . . . . .	30,474.00
Instructor Preparation . . . . .	<u>16,000.00</u>
TOTAL START-UP COSTS	\$59,034.00

- \*Other vendors should be considered.
- \*\*Provides 1 spare
- \*\*\*Provides 8 spares

As conceived, start-up costs would be "one time" expenditures that would occur as part of the program preparation.

Based upon our experience with the MRC, we strongly recommend the use of communication gear. While this is a significant cost item (\$30K), it only represents 7-8% of the overall cost of the training program. Thus, given the important instructional advantages provided by the communication gear, we believe that its cost in relationship to overall costs is justified.

### Administrative Costs

Costs associated with administration of the training program are presented in Table 2 in terms of the following categories:

1. Labor (course administrator, secretary, etc.).
2. Services (insurance for motorcycles, advertising, reconditioning, of motorcycles, etc.).
3. Consumable Materials (student textbooks, gasoline, replacement parts, etc.).

These costs would occur throughout conduct of the training program and represent all necessary expenditures except instructor costs.

TABLE 2

ADMINISTRATIVE COSTS  
(For Two Year Operational Period)

LABOR

<u>Person</u>	<u>% Commitment</u>	<u>Yearly Salary</u>	<u>Cost</u>
Course Administrator	50	\$24,000	\$24,000.00
Secretary	25	12,000	6,000.00
Head Mechanic/Aide <sup>1</sup>	100	12,000	24,000.00
Asst. Mechanic/Aide <sup>1</sup>	40	10,000	<u>8,000.00</u>
		Total	\$62,000.00

SERVICES

<u>Item</u>	<u>Quantity</u>	<u>Cost</u>	<u>Total</u>
License Plates	60	\$ 4.00/yr.	\$ 480.00
Insurance	60	90.00/yr.	10,800.00
Motorcycle Reconditioning <sup>2</sup>	240	50.00/MC	12,000.00
Advertising <sup>3</sup>	--	--	10,000.00
Xeroxing/Printing	--	--	1,000.00
Comm. Gear Repair	--	--	500.00
Equipment Replacement <sup>4</sup>	--	--	<u>2,000.00</u>
		Total	\$36,780.00

CONSUMABLE MATERIALS (Costs Per Round)<sup>5</sup>

<u>Item</u>	<u>Quantity</u>	<u>Cost</u>	<u>Total</u>
Student Textbooks	400	\$ 2.00	\$ 800.00
Gasoline	600/gal.	.65	390.00
Oil	50/qts.	1.20	60.00
Spark Plugs	60	1.40	84.00
Replacement Parts	--	--	400.00
Misc.	--	--	<u>100.00</u>
		Total	\$ 1,834.00
TOTAL X 14 ROUNDS			\$25,676.00

Summary of Administrative Costs

Labor	\$ 62,000.00
Services	36,780.00
Consumable Materials	<u>25,676.00</u>
 TOTAL ADMINISTRATIVE COSTS	 \$124,456.00

NOTES

1. This person would serve as the course/mechanic/aide on the days the head mechanic had off, and would assist the head mechanic in labor intensive duties (e.g., preparing motorcycles for course, end of course repairs).
2. Assumes that a new allotment of motorcycles would be obtained every six months.
3. Includes: Newspaper ads, TV & radio PSAs, posters, mailings, flyers.
4. Equipment (e.g., helmets) that needs to be replaced because of theft or irreparable damage.
5. Assumes: 30 sections/round.  
Total number of students = 360 (12 students X 30 sections)  
60 Motorcycles on hand.

### Instructor Costs by Course Configuration

Three course configurations are being considered for the training program:

1. 23 hour street. This would be the MRC with three, one hour, street sessions.
2. 22 hour no street. This would be the MRC without street sessions, but with two, one hour, range sessions designed to substitute for the street riding.
3. 15 hour no street. This would be a shortened version of the MRC appropriate for students with some riding experience. Specifically, this course would not include certain of the material now covered prior to the Range Skill Test (e.g., mounting the motorcycle, buddy push) and/or would present this material in an accelerated fashion.

ASA conducted street vs. no street versions of the 23 hour MRC this summer, and is in the process of analyzing the resultant performance data. The output of these analyses will shed light on the cost-effectiveness of each of these configurations.

ASA has also developed a course outline for a 15 hour course and proposes to develop and field test this course during the spring of 1979.

For the demo project, ASA recommends that NHTSA consider offering two or three different course configurations. For example, the 22 hour no street course might be appropriate for 60% of the applicants, while the 15 hour course would best serve the needs of the remaining 40%.

While the required mix of course offering is not known at this time, we have presented in Table 3 a breakdown of instructor costs for each of the course configurations discussed above.

TABLE 3

INSTRUCTOR COSTS BY COURSE CONFIGURATION  
(For 2 Year Program)

<u>Instructor Hours*</u>	<u>Course Configuration</u>		
	<u>23 Hr. Street</u>	<u>23 Hr. No Street</u>	<u>15 Hr. No Street</u>
Regular Instruction	45	37	27
Remedial Instruction	6	6	4
Prep Time	10	9	6
Administrative Time	2	2	2
TOTAL	63	54	39
x 420 Sections	26,460	22,680	16,380
x \$10/hr.	\$264,600	\$226,800	\$163,800

\*Includes time of head instructor and range instructor.

### Summary of All Costs by Course Configuration

Table 4 presents a summary of all costs (start-up, administrative, instructor) for each of the three course configurations.

Based on these data, ASA recommends that approximately \$500,000 be set aside for the training aspect of the demo project. This would more than adequately cover the most expensive course configuration (i.e., 23 hour street).

The results of on-going data analyses and field testing of the 15 hour course next spring, will provide the data necessary for determining the extent to which the less expensive course configurations should be used. Monies saved by using these configurations could be used to train more than 5,000 students and/or to reduce the overall costs of the demo project.

TABLE 4

## SUMMARY OF ALL COSTS BY COURSE CONFIGURATION

	<u>Course Configuration</u>		
	<u>23 Hr. Street</u>	<u>23 Hr. No Street</u>	<u>15 Hr. No Street</u>
Start-Up Costs	\$ 59,034	\$ 56,234 <sup>1</sup>	\$ 56,234 <sup>1</sup>
Administrative Costs	124,456	114,499 <sup>2</sup>	99,565 <sup>3</sup>
Instructor Costs	264,600	226,688	163,800
TOTAL	\$448,090	\$397,421	\$319,599
+ 5% <sup>4</sup>	\$470,495	\$417,293	\$335,579
COST/GRADUATE <sup>5</sup>	\$ 133.36	\$ 118.28	\$ 95.12

## NOTES

1. \$2,800 in communication gear used only for street sessions (e.g., head sets, push-to-talk switches) has been subtracted.
2. Administrative costs reduced by 8% to cover modest savings in labor (e.g., mechanic's time) and materials (e.g., gasoline) that result from not conducting street sessions.
3. Administrative costs reduced by 20% to cover savings in labor and materials that would occur if only a 15 hour course were offered.
4. 5% added to cover inflation between now and when the demo is actually conducted.
5. 420 sections X 12 students/section = 5,040 students who start course.  
5,040 X .70 completion rate = 3,528 students who graduate.  
\$470,495/3528 = \$133.36.

APPENDIX C

STUDY CONCERNING BRAKING AND TURNING MANEUVERS

DEVELOPMENT AND TESTING OF IMPROVED  
TRAINING EXERCISES FOR  
BRAKING AND TURNING MANEUVERS

Introduction

During conduct of the Field Test of the Motorcycle Rider Course (FTMRC), a variety of evaluation instruments were used to assess student performance. A key evaluation tool, based upon its proven effectiveness in other motorcycle research projects, was the Motorcycle Operator Skill Test (MOST). The MOST was used in the FTMRC as an end-of-course performance measure.

The MOST consists of nine separate exercises which are arranged and administered in a hierarchical fashion from least difficult to most difficult. From the outset of the FTMRC, many students had difficulty with the last three exercises on the MOST (Exercise 7 - Quick Stop-Straight, Exercise 8 - Obstacle Turn, Exercise 9 - Quick Stop-Curve). This fact is illustrated in Table 1, which presents MOST failure rate by exercise (since failure rates by exercise have not been firmly established, the "failure" data in this table are based on three or more penalty points for Exercises 1 and 2, and five or more penalty points for Exercises 3-9).

Table 1

MOST Failure Rate by Exercise  
for Rounds 1-4

<u>MOST Exercise</u>	<u>Failure Rate (%)</u>
1. Starting and Moving up a Hill	13.3%
2. Sharp Turn	7.7%
3. Accelerating in a Turn	20.1%
4. Slowing in a Turn	4.7%
5. Normal Stop	11.5%
6. Turning Speed Selection	26.8%
7. Quick Stop-Straight	41.0%
8. Obstacle Turn	68.4%
9. Quick Stop-Curve	74.3%

During conduct of the first four rounds of the FTMRC, curriculum revisions designed to improve performance on Exercise 7 - Quick Stop-Straight were developed and implemented. These revisions produced a noticeable

improvement in performance on this exercise as evidenced by the following failure rates for Exercise 7 by Round: Round 1 - 64.7 percent, Round 2 - 55.4 percent, Rounds 3 and 4 - 29.5 percent.

Given the success achieved with Exercise 7, the purpose of the effort described herein was to develop and implement curriculum revisions that would improve performance on MOST Exercises 8 and 9. This work was conducted as a separate project from the FTMRC and involved four major activities:

1. Modify the MRC curriculum to place greater emphasis on the range exercises designed to teach evasive turns (obstacle turn) and stopping on a curve.
2. Implement, during the fall of 1980, these curriculum revisions in sections of the MRC offered through the Jefferson County Public Schools (Lakewood, Colorado).
3. Administer the MOST to the students who received this revised course.
4. Compare the results of the above test with results from previous rounds of the FTMRC.

Conduct and results of these activities are described in the sections that follow.

#### Modify MRC Curriculum

In order to place greater emphasis on evasive turns and stopping on a curve, it was necessary to modify or delete certain of the existing range exercises. This was required, since we did not wish to add to the total length of the 20-hour MRC. The following modifications/deletions were made:

1. "Starting on a Hill" (Range Exercise 29) was moved from Session 13 to Session 12. We have found that this exercise can be effectively taught to students on an individual basis during the "Simulated Traffic Situations" range exercise. That is, students are individually asked to leave the "street mix" and given practice on the hill exercise. To accommodate this modification, "Simulated Traffic Situations" was shortened from 50 to 40 minutes.
2. "Circuit Training" (Range Exercise 28) was eliminated from Session 12. This exercise has proved problematic in that students are riding many different directions simultaneously. Furthermore, the pacing of students during this exercise is difficult due to students with weaker skills "plugging up" the circuit, even though

they are told to pull out of the circuit if they stall, Elimination of this exercise freed 35 minutes of instructional time.

3. "Engine Braking" (Range Exercise 33) was eliminated from Session 14. Given the preponderance of two-stroke training motorcycles, this exercise has been relatively ineffective (i.e., the two-stroke machines provide little in the way of engine braking). Elimination of this exercise freed 15 minutes of instructional time.

The modification/deletions outlined above resulted in a "savings" of 60 minutes. These 60 minutes were used as follows:

1. "Stopping on a Curve" (Range Exercise 36) was expanded from 20 minutes to 50 minutes. The range layout and directions for the exercise were also revised (see Exhibit 1).
2. "Countersteering" (Range Exercise 39) was expanded from 15 minutes to 30 minutes.
3. "Quick Lane Changes" (Range Exercise 40) was expanded from 15 minutes to 30 minutes.

Exhibit 2 provides an outline of the revised curriculum described above. For comparison purposes, Exhibit 3 provides the original MRC curriculum for Range Sessions 12-17.

#### Administer Revised MRC Curriculum

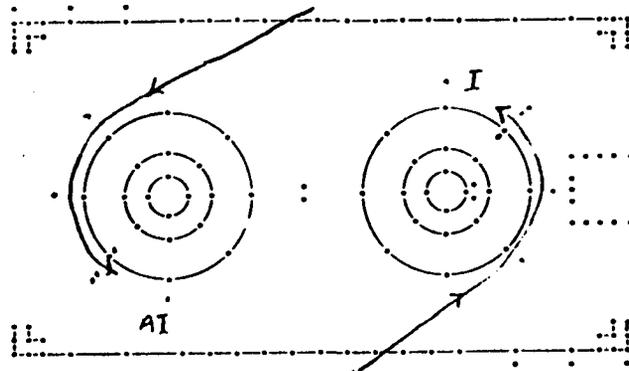
During the summer and fall of 1980, ASA, in conjunction with the Jefferson County Public Schools, offered the MRC to residents of Metropolitan Denver. In order to partly cover operational costs, student's were required to pay a course fee of \$65.

Students who participated in the fall courses (September 2-October 26) were administered the revised version of the MRC and were asked to take the MOST upon completion of the MRC.<sup>1</sup> While not part of the FTMRC, this fall round of course offerings was, in fact, the eighth round of MRC course offerings at the Jefferson County facility. Accordingly, in the results and discussion which follows, this administration of the revised MRC is labeled "Round 8."

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<sup>1</sup>It was originally planned to have all summer/fall students take the revised MRC and the MOST. However, NHTSA funding for this special project was not formally approved until 3 September 1980.

RANGE EXERCISE 36  
STOPPING ON A CURVE



ADDITIONAL DIRECTIONS

1. Have students ride curve passing between pairs of cones.
2. After familiarizing students with prescribed path, have them do the following:
  - a. Begin to brake after passing the first double pair of cones. The objective is to have students "right" motorcycle out of leaning attitude.
  - b. After students are "righting" the motorcycle, have them apply more braking power to stop as quickly as possible.
  - c. Have students stop at last set of cones.
3. Once students master point 2, have them stop in the shortest distance possible on command.

Exhibit 1. Sample Stopping on a Curve Exercise (New)

<u>Range Session</u>	<u>Range Exercise</u>	<u>Description</u>	<u>Time</u>
12	25	Simulated Traffic Situations	40
	26	Passing Other Vehicles	10
	29	Starting on a Hill	10
13	27	Turning Speed Judgment	15
	30	Stop and Go	15
	31	Diminishing Lane, Staggered Serpentine	15
	32	One Hand Control of Motorcycle	15
14	34	Controlling Rear Wheel Skids	20
	35	Quick Stops	20
	36	Stopping on a Curve	20
16	36	Stopping on a Curve	30
	39	Countersteering	30
17	37	Riding on the Pegs	5
	38	Crossing Obstacles	10
	40	Quick Lane Changes	30
	41	Carrying Passengers	10

Exhibit 2. Revised Curriculum

<u>Range Session</u>	<u>Range Exercise</u>	<u>Description</u>	<u>Time</u>
12	25	Simulated Traffic Situations	50
	26	Passing Other Vehicles	10
13	27	Turning Speed Judgment	15
	28	Circuit Training	35
	29	Starting on a Hill	10
14	30	Stop and Go	15
	31	Diminishing Lane, Staggered Serpentine	15
	32	One Hand Control of Motorcycle	15
	33	Engine Braking	15
16	34	Controlling Rear Wheel Skids	20
	35	Quick Stops	20
	36	Stopping on a Curve	20
17	37	Riding on the Pegs	5
	38	Crossing Obstacles	10
	39	Countersteering	15
	40	Quick Lane Changes	15
	41	Carrying Passengers	10

Exhibit 3. Original Curriculum

## Results

A total of 48 students completed the revised version of the MRC offered during the fall of 1980. A breakdown of these students by age and sex is provided in Table 2.

Table 2

### Round 8 Enrollment by Age and Sex

<u>Age</u>	<u>Male</u>		<u>Female</u>		<u>Total</u>	
	<u>Row Percent</u>	<u>Column Percent</u>	<u>Row Percent</u>	<u>Column Percent</u>	<u>n</u>	<u>Column Percent</u>
15-17	50.0	4.3	50.0	4.0	2	4.2
18-25	33.3	4.3	66.7	8.0	3	6.2
26-35	25.0	21.7	75.0	60.0	20	41.7
36-45	62.5	21.7	37.5	12.0	8	16.7
46+	73.3	47.8	26.7	16.0	15	31.2
TOTAL	47.9	100.0	52.1	100.0	48	100.0

For purposes of comparison, the same breakdown for students in Rounds 1-4 is provided as Table 3.<sup>2</sup>

Table 3

### Round 1-4 Enrollment by Age and Sex

<u>Age</u>	<u>Male</u>		<u>Female</u>		<u>Total</u>	
	<u>Row Percent</u>	<u>Column Percent</u>	<u>Row Percent</u>	<u>Column Percent</u>	<u>n</u>	<u>Column Percent</u>
15-17	73.2	56.4	26.8	31.3	228	46.4
18-25	51.9	14.2	48.1	20.0	81	16.5
26-35	33.3	9.1	66.7	27.7	81	16.5
36-45	52.6	10.1	47.4	13.8	57	11.6
46+	68.2	10.1	31.8	7.2	44	9.0
TOTAL	60.3	100.0	39.7	100.0	491	100.0

<sup>2</sup>Data from Rounds 5, 6, and 7 are not presented, since these rounds involved different course configurations and served special populations.

Comparison of Tables 2 and 3 reveals the following important points:

1. In Round 8 over half (52.1 percent) of the students were female. This compares to 39.7 percent female in Rounds 1-4.
2. In Round 8 close to 90 percent (89.6 percent) of the students were 26 or older. In Rounds 1-4, only 37.1 percent of the students were 26 or older.

In short, compared to previous rounds, Round 8 had a higher percentage of female students and a much higher percentage of "older" students. As discussed below, this "skewed" distribution likely had a confounding effect on the study results.

Table 4 presents failure rate on each of the nine MOST exercises for Round 8 and Rounds 1-4.

Table 4

MOST Failure Rate by Exercise  
for Round 8 and Rounds 1-4

<u>MOST Exercise</u>	<u>Round 8 Failure Rate (%)</u>	<u>Rounds 1-4 Failure Rate (%)</u>
1. Starting and Moving Up a Hill	22.9	13.3
2. Sharp Turn	8.3	7.7
3. Accelerating in a Turn	39.6	20.1
4. Slowing in a Turn	4.2	4.7
5. Normal Stop	16.7	11.5
6. Turning Speed Selection	39.6	26.8
7. Quick Stop-Straight	70.8	41.0
8. Obstacle Turn	87.5	68.4
9. Quick Stop-Curve	91.7	74.3

On eight of the nine exercises, Round 8 students had a noticeably higher failure rate than their counterparts in Rounds 1-4. The Round 8 students did score slightly better than the Round 1-4 students on one exercise ("Slowing on a Turn"). These data strongly suggest that the curriculum modifications had no effect on the three exercises they were designed to impact. On the other hand, the fact that the Round 8 students did so poorly on almost all exercises suggests that the students, not the curriculum, may be the problem.

Table 5 presents the distribution of MOST scores by age category for the Round 8 students.

Table 5

MOST Score by Age Category

MOST Score Category	<u>Age Category</u>			
	15 - 25		26 - 62	
	<u>n</u>	<u>Percent</u>	<u>n</u>	<u>Percent</u>
0-4	--	--	--	--
5-9	--	--	3	7.0
10-14	--	--	3	7.0
15-19	1	20.0	3	7.0
20-24	3	60.0	10	23.0
25-29	1	20.0	9	21.0
30	--	--	15	35.0

The data in Table 5 reveal extremely poor performance for over half of the "older" students. That is, 56 percent of the students age 26-62 scored 25 or higher on the MOST. This finding is consistent with performance test results noted during the FTMRC--older students (26 and above) scored much higher on the Range Skill Test and the MOST than their younger counterparts. However, as illustrated in Table 6, scores on the MOST for all students in Round 8 were substantially higher than the scores for comparable age groups in Rounds 1-4.

Table 6

Mean MOST Score by Age Category  
for Round 8 and Rounds 1-4

<u>Age Category</u>	<u>Round 8</u>		<u>Rounds 1-4</u>	
	<u>n</u>	<u>x</u>	<u>n</u>	<u>x</u>
15-17	2	23.5	138	16.3
18-25	3	21.3	51	17.9
26-35	20	22.6	53	19.1
36-45	8	28.4	34	20.0
46+	15	26.9	24	22.4

Examination of Table 6 reveals that the sample sizes in Round 8 for age categories 15-17 and 18-25 are extremely small; thus, definitive conclusions regarding these categories cannot be made. For the upper three age categories (26-35, 36-45, 46+), it is clear that the performance of the Round 8 students was poorer. This effect is particularly pronounced for age categories 36-45 and 46+.

Examining the Round 8 data by sex reveals a finding consistent with the results from the FTMRC. Namely, as presented in Table 7, female students had greater difficulty with the MOST. For example, 65.1 percent of the males scored 24 or less on the MOST while only 36.0 percent of the females had scores of 24 or lower.

Table 7  
MOST Total Score By Sex

<u>MOST Score Category</u>	<u>Male</u>		<u>Female</u>	
	<u>Cell Percent</u>	<u>Cumulative Percent</u>	<u>Cell Percent</u>	<u>Cumulative Percent</u>
0-4	0.0	0.0	0.0	0.0
5-9	8.7	8.7	4.0	4.0
10-14	13.0	21.7	4.0	8.0
15-19	13.0	34.7	8.0	16.0
20-24	30.4	65.1	20.0	36.0
25-29	21.7	86.8	24.0	60.0
30+	13.0	100.0	40.0	100.0

The last demographic variable examined in this study was pre-course riding experience. On their application form, students were simply asked if they had previously operated a motorcycle as the driver (versus passenger). Of the 48 students in Round 8, 17, or 35 percent, indicated that they had previously operated a motorcycle. The distribution of MOST scores by this variable is presented in Table 8.

Table 8

## MOST Total Score By Pre-Course Riding Experience

<u>MOST Score Category</u>	<u>Pre-Course Riding Experience</u>			
	<u>Yes</u>		<u>No</u>	
	<u>Cell Percent</u>	<u>Cumulative Percent</u>	<u>Cell Percent</u>	<u>Cumulative Percent</u>
0-4	0.0	0.0	0.0	0.0
5-9	16.7	16.7	0.0	0.0
10-14	11.1	27.8	9.5	9.5
15-19	5.5	33.3	24.3	23.8
20-24	22.2	55.5	9.5	33.3
25-29	22.2	77.7	28.6	61.9
30+	22.2	100.0	38.1	100.0

These data reveal that students with some pre-course riding experience scored somewhat better on the MOST. For example, 27.8 percent of the students with pre-course riding experience obtained a MOST score of 14 or less. The comparable figure for students with no pre-course riding experience is 9.5 percent. Overall, however, these data suggest that pre-course riding experience did not have a strong influence on MOST performance. Compared with students from previous rounds, the Round 8 students with pre-course riding experience still scored poorly on the MOST.

Discussion

The results described above suggest that the curriculum revisions examined in this study had no effect on the MOST exercises they were designed to impact. It is, however, our judgment that the results of this study are inconclusive due to the particular mix of students that participated in Round 8. As presented in the results section, the students in Round 8 differed from those in previous rounds in three important ways:

1. They were substantially older.
2. Over half of the students were female.
3. As a group, they obtained very poor scores on eight of the nine MOST exercises.

For these reasons, it is not possible to use previous student groups and their MOST scores as a baseline against which to assess the effects of the curriculum revisions. Simply put, the Round 8 students turned out to

be totally unrepresentative with respect to previous groups of students that took the MRC at the Jefferson County facility.

### Recommendations

The braking and turning skills examined in this study should be addressed in future projects. MOST data continues to indicate that students score poorly on Exercises 8 and 9. For the MRC to be a maximally effective accident countermeasures, the curriculum for braking in a turn, and evasive turns, must be refined and improved to the extent possible within a 20-hour course.

Curriculum revisions of the type used in this study, and/or new revisions, should be implemented in a large-scale study where random assignment to different treatment groups (i.e., "old MRC" versus revised MRC) would be possible. These groups could then be compared on the MOST in a straightforward fashion. Such a design is necessary since, as we have seen in this study, MOST performance varies as a function of demographic factors, as well as training conditions. Only in a completely randomized design can these demographic factors be "controlled."

From our viewpoint, it would be highly desirable to use certain "sections" of the New York demonstration project as a test bed for further evaluation of the issues addressed in the present study.

APPENDIX D

SURVEY INSTRUMENT AND

DETAILED RESULTS FOR EXPOSURE/TRANSPORATION MOBILITY STUDY

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**SURVEY OF  
MOTORCYCLE  
RIDER COURSE  
GRADUATES**

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**SURVEY OF  
MOTORCYCLE RIDER COURSE  
GRADUATES**

Name: \_\_\_\_\_ Age: \_\_\_\_\_

Current Address: \_\_\_\_\_

1. Please give the approximate date you took the Motorcycle Rider Course (MRC) (check one)

(1) \_\_\_\_\_ Fall 1977    (3) \_\_\_\_\_ Summer 1978    (5) \_\_\_\_\_ Fall 1979    (7) \_\_\_\_\_ Summer 1980

(2) \_\_\_\_\_ Spring 1978    (4) \_\_\_\_\_ Summer 1979    (6) \_\_\_\_\_ Spring 1980    (8) \_\_\_\_\_ Fall 1980

2. Do you currently own or have use of an auto, van, or truck?    NO \_\_\_\_\_(1)    YES \_\_\_\_\_(2)

3. Do you currently own a motorcycle?    NO \_\_\_\_\_(1)    YES \_\_\_\_\_(2)

*If yes, what year:* \_\_\_\_\_ *Make:* \_\_\_\_\_ *Size:* \_\_\_\_\_ cc

*When purchased (give month and year)?* \_\_\_\_\_

4. Are you presently licensed to operate a motorcycle?    NO \_\_\_\_\_(1)    YES \_\_\_\_\_(2)

*If no, have you ever been licensed to operate a motorcycle?*    NO \_\_\_\_\_(1)    YES \_\_\_\_\_(2)

5. If you are or were a licensed motorcyclist, when did you obtain your license?

(1) \_\_\_\_\_ Before taking the MRC

(2) \_\_\_\_\_ During or after taking the MRC

*If you obtained your license during or after the MRC, would you have obtained a license if you had not taken the MRC?*

(01) \_\_\_\_\_ YES

\_\_\_\_\_ NO (Please explain why taking the MRC enabled you to obtain a license)

\_\_\_\_\_  
( )

6. If you have never been a licensed motorcyclist did taking the MRC cause you to decide not to get a license?

(01) \_\_\_\_\_ NO

\_\_\_\_\_ YES (Please explain how taking the MRC caused you to decide against getting the motorcyclist license)

\_\_\_\_\_  
( )

7. Have you driven a motorcycle on the street since taking the MRC?

(1) \_\_\_\_\_ YES

(2) \_\_\_\_\_ NO

*If no, you have completed this survey . . . . THANK YOU.*

*If yes, please continue on with Question 8.*

8. For how long have you been riding a motorcycle on the street?

\_\_\_\_\_ Years                      \_\_\_\_\_ Months

9. We are interested in determining the particular transportation needs being served by your using a motorcycle. Three categories of travel are listed by A, B and C at the bottom of the page (note that under each category we have provided examples of the type of *trips* that fit the category). For each category, consider *one trip* to be going someplace and returning — for example, going to work and back home would be *one trip*.

For each category please do the following:

1. Think of a "typical" *seven-day week* during the time of the year when you might ride a motorcycle on the street (e.g., April — October), and for each trip category, estimate the average number of trips you would normally make on a motorcycle. Write these estimates in the column labeled "Estimated Number of Motorcycle Trips."
2. For each trip category, please estimate the *average* number of miles *per trip*. Place this number in the Miles/Trip column.

<u>Trip Categories</u>	<u>Estimated Number of Motorcycle Trips</u>	<u>Estimated Miles/Trip</u>
A. WORK (to or from work and/ or school)	_____	_____
B. OTHER REQUIRED TRIPS (e.g., shopping, work-related or personal errands, interviews, medical appointments, meals)	_____	_____
C. RECREATIONAL/PLEASURE TRIPS (e.g., sightseeing, "out for a ride," visiting, sporting events, movies)	_____	_____

10. Consider those periods when you have driven a motorcycle as compared to those periods (e.g., in the winter or before you owned a motorcycle) when you didn't. How did driving a motorcycle change your reliance on each of these other forms of transportation?

	<u>Less Reliance</u>	<u>No Change</u>	<u>Greater Reliance</u>
1. Driving your car, truck or van	(1) _____	(2) _____	(3) _____
2. Riding (as a passenger) with others	(1) _____	(2) _____	(3) _____
3. Public transportation	(1) _____	(2) _____	(3) _____
4. Walking	(1) _____	(2) _____	(3) _____
5. Bicycling	(1) _____	(2) _____	(3) _____

11. Considering *all* forms of transportation, to what extent has driving a motorcycle changed the total number of trips you take or the total amount of miles you travel?

	Less	No Change	More
1. Total trips	(1) _____	(2) _____	(3) _____
2. Total miles traveled	(1) _____	(2) _____	(3) _____

12. To what extent has the use of a motorcycle permitted you to make trips that you would have been unable to make otherwise? (check one)

Not at All	To Some Extent	To a Great Extent
(1) _____	(2) _____	(3) _____

13. To what extent has riding a motorcycle changed the *total* amount of money you spent for transportation? (check one)

Increased Amount	No Change	Decreased Amount
(1) _____	(2) _____	(3) _____

14. Please estimate the total number of miles you drove *any* motor vehicle on the road during the last 12 months. \_\_\_\_\_ Miles

15. For the miles listed in question 14 above, what proportion were on a motorcycle with you as the driver? (check one)

(1) _____ None	(5) _____ 51 – 70%
(2) _____ less than 10%	(6) _____ 71 – 90%
(3) _____ 10 – 30%	(7) _____ over 90%
(4) _____ 31 – 50%	

16. What proportion of your riding is on the street or highway as opposed to off-road and trail-riding or range? (check one)

(1) _____ All street/highway	(4) _____ Mostly off-road
(2) _____ Mostly street/highway	(5) _____ All off-road
(3) _____ About 50-50	

17. Please consider the reasons why you ride a motorcycle. List below, in order of importance (number 1 most important, number 2 next most important, etc.) the primary reasons you use a motorcycle.

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_
3. \_\_\_\_\_  
\_\_\_\_\_
4. \_\_\_\_\_  
\_\_\_\_\_
5. \_\_\_\_\_  
\_\_\_\_\_

Table D-1

Age Distribution for Respondents  
to Survey of MRC Graduates

<u>Age Category</u>	<u>n</u>	<u>Percent</u>
18-22	75	58.6
26-35	13	10.2
36-45	24	18.7
46-76	<u>16</u>	<u>12.5</u>
TOTAL	128	100.0

Table D-2

Time Frame When Respondent  
Took the MRC

<u>Time Frame</u>	<u>n</u>	<u>Percent</u>
Fall 1977	40	31.2
Spring 1978	46	35.9
Summer 1979	22	17.2
Fall 1979	7	5.5
Spring 1980	5	3.9
Not Indicated (NI)	<u>8</u>	_____
TOTAL	128	100.0

Table D-3

Current Ownership or Use of  
Auto, Van or Truck

<u>Response</u>	<u>n</u>	<u>Percent</u>
Yes	117	91.4
No	8	6.2
NI	<u>3</u>	<u>3.0</u>
TOTAL	128	100.0

Table D-4

## Current Ownership of Motorcycle

<u>Response</u>	<u>n</u>	<u>Percent</u>
Yes	67	52.3
No	58	45.3
NI	<u>3</u>	<u>2.3</u>
TOTAL	128	100.0

Table D-5

## Currently Licensed to Operate a Motorcycle

<u>Response</u>	<u>n</u>	<u>Percent</u>
Yes	79	61.7
No	<u>49</u>	<u>38.3</u>
TOTAL	128	100.0

Table D-6

## Ever Licensed to Operate a Motorcycle

<u>Response</u>	<u>n</u>	<u>Percent</u>
Yes	88	68.7
No	<u>40</u>	<u>31.3</u>
TOTAL	128	100.0

Table D-7

When License Was Obtained  
(vis-a-vis MRC)

<u>Response</u>	<u>n</u>	<u>Percent</u>
Before Taking MRC	22	25.0
During/After MRC	65	73.9
NI	<u>1</u>	<u>1.1</u>
TOTAL	88	100.0

Table D-8

If During/After for No. 5, Would You Have  
Obtained License Had you Not Taken MRC?

<u>Response</u>	<u>n</u>	<u>Percent</u>
Yes	29	44.6
No	32	49.2
NI	<u>4</u>	<u>6.2</u>
TOTAL	65	100.0

Table D-9

If No for 5a, Reasons MRC Helped  
You to Get a Motorcycle License

<u>Response</u>	<u>n</u>	<u>Percent</u>
Provided Structured Opportunity to Learn How to Ride	9	28.1
Provided Skill/Experience Development	9	28.1
Overcame Fear/Increased Confidence	8	25.1
Helped Prepare for License Test	4	12.5
Increased Interest in Motorcycling	<u>2</u>	<u>6.3</u>
TOTAL	88	100.0

Table D-10

For Unlicensed Respondents--Did Taking  
the MRC Cause You to Decide Against Obtaining a License

<u>Response</u>	<u>n</u>	<u>Percent</u>
Yes	5	10.2
No	<u>44</u>	<u>89.8</u>
TOTAL	49	100.0

Table D-11

If Yes to No. 6, Reasons MRC Helped  
You Decide Against Obtaining a License

<u>Response</u>	<u>n</u>	<u>Percent</u>
Provided Awareness of What Riding Requires	1	20.0
Showed That Riding is Too Dangerous	3	60.0
Yes, Not Further Specified	<u>1</u>	<u>20.0</u>
TOTAL	5	100.0

Table D-12

Have You Driven a Motorcycle  
On the Street Since Taking the MRC?

<u>Response</u>	<u>n</u>	<u>Percent</u>
Yes	89	69.5
No	<u>39</u>	<u>30.5</u>
TOTAL	128	100.0

Table D-13

For Respondents who Answered Yes to No. 7,  
Length of Time They Have Been Riding on Street

<u>Response</u>	<u>n</u>	<u>Percent</u>
<1 year	15	16.8
1-2 years	12	13.5
2-3 years	21	23.6
3-4 years	23	25.8
>4 years	12	13.5
NI	<u>6</u>	<u>6.7</u>
TOTAL	89	100.0

Table D-14

Use of Motorcycle to Ride To and From Work  
(Median Trip Length = 17 miles)

<u>Average Number of Trips per Week</u>	<u>n</u>	<u>Percent</u>
None	36	41.9
1-3	18	20.9
4-6	19	22.1
>6	<u>13</u>	<u>15.1</u>
TOTAL	86	100.0

Table D-15

Use of Motorcycle for "Other Required Trips"  
(e.g., Shopping, Errands, Meals, etc.)  
(Median Trip Length = 10 miles)

<u>Average Number of Trips per Week</u>	<u>n</u>	<u>Percent</u>
None	38	44.2
1-3	24	27.9
4-6	14	16.3
>6	<u>10</u>	<u>11.6</u>
TOTAL	86	100.0

Table D-16

Use of Motorcycle for Recreation/Pleasure Trips  
(Median Trip Length = 20 miles)

<u>Average Number of Trips per Week</u>	<u>n</u>	<u>Percent</u>
None	15	17.4
1-3	49	57.0
4-6	12	14.0
>6	<u>10</u>	<u>11.6</u>
TOTAL	86	100.0

Table D-17

How Riding a Motorcycle Has Changed Reliance  
on Other Forms of Transportation  
(Distribution Based on 82 Responses)

<u>Transportation Mode</u>	<u>Less Reliance</u>	<u>No Change</u>	<u>Greater Reliance</u>
Driving car, truck or van	47.0%	47.0%	6.0%
Riding (as passenger) with others	28.9%	66.3%	4.8%
Public transportation	25.6%	65.8%	8.5%
Walking	25.2%	65.8%	11.0%
Bicycling	19.3%	72.3%	8.4%

Table D-18

Considering All Forms of Transportation, to What Extent Has  
Riding a Motorcycle Changed the Total Number of Trips You  
Take or the Total Miles You Travel?  
(Distribution Based on 82 Responses)

<u>Trips/Miles</u>	<u>Less</u>	<u>No Change</u>	<u>More</u>
Total Trips	6.1%	61.0%	32.9%
Total Miles Traveled	6.3%	60.8%	32.9%

Table D-19

To What Extent Has Use of a Motorcycle Permitted You  
to Make Trips You Would Have Been Unable to Make Otherwise?

<u>Response</u>	<u>n</u>	<u>Percent</u>
Not at All	27	32.5
To Some Extent	40	48.2
To a Great Extent	16	19.3
TOTAL	83	100.0

Table D-20

To What Extent Has Riding a Motorcycle Changed  
the Total Amount of Money You Spend for Transportation

<u>Response</u>	<u>n</u>	<u>Percent</u>
Increased Amount	11	13.1
No Change	31	36.9
Decreased Amount	<u>42</u>	<u>50.0</u>
TOTAL	84	100.0

Table D-21

Estimate of the Total Miles Driven (in All Vehicles)  
During Last 12 Months

<u>Response Category</u>	<u>n</u>	<u>Percent</u>
<1000 miles	9	10.7
1K-5K	17	20.2
6K-10K	17	20.2
11K-15K	23	27.4
16K-20K	12	14.3
>70K	<u>6</u>	<u>7.1</u>
TOTAL	84	100.0

Table D-22

Proportion of Total Miles (No. 14 Above)  
That Were On a Motorcycle With You as Driver

<u>Response</u>	<u>n</u>	<u>Percent</u>
None	5	5.9
<10%	32	38.1
10-30%	20	23.8
31-50%	7	8.3
51-70%	9	10.7
71-90%	2	2.4
>90%	<u>9</u>	<u>10.7</u>
TOTAL	84	100.0

Table D-23

Cross-Tabulation of Responses from Questions 14 and 15

Total Miles Traveled Per Year*	<u>Proportion of Travel on a Motorcycle</u>															
	None		<10%		10-30%		31-50%		51-70%		71-90%		>90%		Row Total	Column Percent
	n	Row Percent	n	Row Percent	n	Row Percent	n	Row Percent	n	Row Percent	n	Row Percent	n	Row Percent		
>1000	0		2	22.2	0	11.1	1						6	66.6	9	10.7
1-5K	0		8	47.1	2	11.8	2	11.8	3	17.6	1	5.9	1	5.9	17	20.2
6-10K	3	17.6	4	23.5	4	23.5	2	11.8	2	11.8	1	5.9	1	5.9	17	20.2
11-15K	1	4.3	9	39.1	9	39.1	2	8.7	1	4.3	0		1	4.3	23	17.4
16-20K	1	8.3	5	41.7	3	25.0	0		3	25.0	0		0		12	14.3
>20K	0		4	66.7	2	33.3	0		0		0		0		6	7.1
Column Total	5		32		20		7		9		2		9		84	
Percent of Grand Total	5.9		38.1		23.8		8.3		10.7		2.4		10.7			

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\* On all Motor Vehicles

Table D-24

Proportion of Riding That is on Street/Highway  
Versus Off-Road

<u>Response</u>	<u>n</u>	<u>Percent</u>
All Street/Highway	40	48.2
Mostly Street/Highway	18	21.7
About 50-50	16	19.3
Mostly Off-Road	6	7.2
All Off-Road	<u>3</u>	<u>3.6</u>
TOTAL	83	100.0

Table D-25

Primary Reason You Ride A Motorcycle

<u>Response Category</u>	<u>n</u>	<u>Percent</u>
Riding is Fun/Enjoyable	36	45.6
Economical Transportation	26	32.9
Recreation, Sightseeing/ Touring, Off-Road Riding/Sports	9	11.4
Utility Purposes-- Shopping, Etc.	2	2.5
Easy to Maneuver	2	2.5
Social Benefits/Image	2	2.5
Contributes to Conversation/Ecology	1	1.3
Other	<u>1</u>	<u>1.3</u>
TOTAL	79	100.0